Computing Services Office

Off-Line

University of Illinois at Urbana-Champaign VOL. 14, NO. 1 January 1986

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	CYBER 174 (NOSB)	**300**	**baud**	**333-4004**
	IBM 3081 GX (VMD)	**300**	**baud**	**333-4006**
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	TELENET (local no.)			**384-6428**
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CSO Sites (see Reference Guide RF-0.3 for operating hours)

Agriculture	N-120	Turner Hall	333-8170
Chemistry	153	Noyes Lab	333-1728
Commerce West	70	Comm West	333-4500
CRH Snack Bar	120	Snack Bar	333-1851
DCL Routing Room	14	DCL	333-6203
Electrical Engineering	146	EEB	333-4936
Florida Ave Res Hall		FAR	333-2695
Illinois St Res Hall		ISR	333-0307
Mechanical Engineering	65	MEB	333-1430
Psychology	453	Psych Bldg.	333-7815
Social Science	202	Lincoln Hall	333-0309

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Academic and research computing is done on the following machines: CDC Cyber 175 running NOS 1; CDC Cyber 174 running NOS 2; IBM 3081 running VM; IBM 4341 running VM; VAX 11/780 running UNIX and driving a GSI CAT-8 phototypesetter; three Pyramids a dn a Sequent running UNIX. In addition CSO serves as Facility Manager for various departmental machines (e.g., other IBMs) and for the National Center for Supercomputing Application's CRAY X/MP.

Operating Hours (see HEARYE,SCHEDUL for exceptions):

	CYBERS 174/175	IBM
M-F	8 am - 6 am	8 am - 6 am
SAT	8 am - Midnight	8 am - 6 am
SUN	Noon - 6 am	Noon - 6 am

POLICY

PLANNED UPDATES FOR SPRING 1986

In keeping with CSO's commitment to improve services to the user community, the following upgrades are planned for the Spring 1986 semester:

- Due to increased demands on the SYTEK network (LocalNet), CSO plans to add more ports on both the IBM and the Cyber systems. We expect to have 16 additional SYTEK ports to the IBM 3081 (VMD) operational by the end of January. The Cyber systems will be provided with 24 additional ports by March, 1986.

- The addition of these new SYTEK ports allows us to convert the Snack Bar (CRH) site to a SYTEK (LocalNet) site during the month of January.

- Also during January, CSO plans to install four SYTEK- connected terminals and a laser printer at the Turner Hall site.

- The Electrical Engineering (EE) site will be converted to SYTEK (LocalNet), probably in March. In addition, we will also be adding several new graphics terminals and a laser printer at EE.

- The acquisition of 64K words Central Memory (CM) and 1 million words Extended Semiconductor Memory has allowed the following upgrades on the Cyber 174 and Cyber 175:

  The Cyber 175 (NOSA) now has 1 million words of Extended Semiconductor Memory (ESM).

  The Cyber 174 (NOSB) now has 256K words Central Memory (CM) and 512K words of Extended Core Memory (ECS).

- A tape system will be added to the facilities at the UNIX site in the English Building during the Spring semester.

- Software known as VMCENTER (from VM Software, Inc.) is currently being installed on the IBM 3081 (VMD) system. VMCENTER is a comprehensive, data center management system for the VM environment that provides control over all major aspects of VM data center service including: disk space management, tape management, system security, accounting and auditing, workload management, and operations. We believe the addition of this software will allow IBM users more latitude in controlling their own environment (e.g., changing their own passwords, etc.). Further news about this software will be published in future issues of OFF-LINE.

NEW CSO TAPE POLICY

Myra Williams

Our tape storage facilities at DCL are filled and we now find it necessary to implement a new, stronger tape policy. In the past we have tried contacting owners of expired temporary tapes, or permanent tapes that have not been used in over a year; however, we have had very little success in getting these

tapes picked up or removed from the building. We feel strongly that the information on these tapes is important and do not want any user to lose data.

Our temporary tape storage is for a 30-day period only. After this 30-day period, we will send these temporary tapes back to the departments specified on the labels, via campus mail. If you do not want your tapes mailed to the department, please pick them up before the expiration limit of 30 days.

We now have approximately 6000 tapes in our permanent tape storage and do not have room for many more. We are currently setting up a policy for the removal and return of permanent tapes that have not been used in over a year. When this policy is implemented, we would appreciate your cooperation in abiding by the new procedures, to insure that tapes do not get lost.

CSO would like to thank the tape users who already have cooperated in removing unused tapes from our storage.

USER TRAINING PROGRAM

Short Courses, Manuals and Training Cassettes
for the CSO Computer Systems
Spring Semester 1986

SHORT COURSES

CSO is offering the following noncredit short courses during the Spring semester 1986 to acquaint potential users with our computing systems, facilities and services.

Short Course Policy

Please note that:

1. CSO makes a small charge for most short courses. This is due to two factors: (1) There is a need for equipment to support improvement in teaching methods; (2) The volume of short courses has risen to the point where it is a serious drain on consulting staff time, and some compensation in staffing must be made. The income is dedicated to support of the short course program.

2. REGISTRATION IS REQUIRED for all courses except where noted. Registration is accomplished by filling out a SEPARATE copy of the registration form and SEPARATE check or voucher for each registration and sending these documents to CSO in either campus or U.S. mail. Walk-in registrations will be accepted in room 150 DCL only during the hours of 3pm to 5pm on working days.

3. The registration form is available on-line from a Cyber terminal via:

   ```
   TYPE,REGFORM/AS/UN=COURSES
   ```

   or you may call 333-1608 and request that one be sent.

4. Each registrant will be sent a confirmation of registration on which the place of meeting is noted. This slip must be taken to all meetings of the class and shown when requested.

5. Refunds of fees will be made only for canceled classes, or upon receipt of an application for refund on or before the day BEFORE the second meeting of the class. There will be no such refunds for classes that meet only once. Application for a refund must be made in room 150 DCL during normal office hours; no applications will be accepted by telephone. Refunds are made by means of a credit memorandum (good for one year); exceptions will be made only in extremely unusual circumstances and at the discretion of the user training coordinator.

6. A copy of the current (updated) short course listing may be examined on-line via:

   TYPE,COURSES/AS/UN=COURSES.

7. Updates (changes) since the printed short course listing was issued may be examined on-line via:

   TYPE,UPDATES/AS/UN=COURSES.

   This file contains current information on courses and sections that have been newly opened, canceled, filled and closed, etc.

8. CSO reserves the right to cancel courses or sections with insufficient enrollment. All fees paid for these classes will automatically be returned.

9. Tax deduction for educational expenses: Treasury Regulation Section 1:162-5 permits an income tax deduction for educational expenses (such as registration fees) undertaken (1) to maintain or improve skills required in one's employment or other trade or business; or (2) to meet express requirements of an employer or a law imposed as a condition for retention of employment, job status, or rate of compensation.

Questions, comments and suggestions should be addressed to the CSO user training coordinator: Ron Szoke, (217) 333-8630; or TELL,SZOKE from a Cyber terminal; or NOTE SZOKE @ UIUCVMD from a CMS terminal; or electronic mail to **uiucuxc!szoke** from a UNIX USENET terminal.

Short Course Summary: Titles

NOTE: For ease of reference, short courses are now classified into six groups, depending on the computing system addressed:

G series: General and Introductory
- G10. Orientation to CSO Facilities and Services
- G18. Data Communications and Networking
- G23. Computing for Poets

M series: Microcomputers (Especially the IBM PC)
- M15. Basic Concepts in Computer Information Processing
- M21. Quick PC
- M41. Using a Word Processing Package
- M43. Using a Spreadsheet Package
- M45. Using a Database Package
- M61. Using a Decision-aiding Package
- M63. Instructional Use of Computer-controlled Video

Statistical Computing

M73. Using a Statistical Package
M75. Micro Versions of Mainframe Statistical Packages

C series: The CDC Cyber Network Operating System (NOS)
C11. Introduction to the Cyber System: NOS Version 1
C12. Introduction to the Cyber System: NOS Version 2
C51. Using the UWRIM Database Management System

Computer Graphics

C61. Easy Graphing
C62. Using Blaze Graphics
C63. Introduction to the DI-3000 Graphics Package

I series: The IBM VM/CMS System
I23. Introduction to IBM Timesharing: CMS and XEDIT
I25. Using the SCRIPT Text Formatter
I31. Using BITNET
I33. Intermediate CMS
I35. Using Magnetic Tapes
I37. Using VMBATCH
I51 Introduction to the VM/SP System Product Interpreter

Statistical Computing

I72. Introduction to BMDP
I76. Introduction to SPSSX
I79. Repeated Measures Analysis Using SPSS, SPSSX, or SAS
I83. Introduction to SAS (Statistical Analysis System)
I84. Orientation to SAS Version 5
I91. Introduction to the Time Series Processor (TSP) Package

Statistical Package Graphics

I98. Introduction to CMS SAS/GRAPH
I99. The SAS/GRAPH Annotate Facility

U series: The UNIX System

U11. Introduction to the UNIX System
U31. UNIX Text Processing
U41. Intermediate UNIX

Statistical Computing

U73. The S Package for Data Analysis and Graphics

X series: Mixed and Other Systems

X37. Using VMBATCH under CMS from the Cyber

Statistical Computing

X77. Using SAS with VMBATCH from the Cyber
X81. Using the SHAZAM Econometric Package

Short Course Listing

G series: General and Introductory

G10. Orientation to CSO Facilities and Services

A brief, nontechnical presentation for prospective users on the following topics: the mission and organization of CSO; computing equipment; locations of facilities and hours of operation; available software; where to obtain documentation; user training (short courses and training tapes); consulting and other services; how to set up a computer account. Recommended manual: *An Index to Software on the Cyber* (see MANUALS, below). No prerequisites. No fee. NO REGISTRATION IS REQUIRED. Six sections will be offered.

1. January 24 12N-1pm 115 DCL [Dingler]
2. January 27 4pm-5pm 505 E. Green, Room 226 [Mills]
3. February 4 8am-9am 115 DCL [Engelbrecht-Wiggans]
4. February 12 12N-1pm 196 Lincoln Hall [Szoke]
5. February 20 3pm-4pm 130 Commerce West [Gengler]
6. February 28 12N-1pm 505 E. Green, Room 226 [Roy]

G18. Data Communications and Networking

This class will discuss: connecting a terminal to a computer both locally and remotely; long distance communication media; EIA RS232 standard interface wiring; modems; multiplexing; file transfer between computers and the software available for accomplishing this. Assumes M15 or equivalent knowledge of computer fundamentals. Fee: $10.

April 7,9,11 3pm-4pm [staff]

G23. Computing for Poets*

A brief general orientation to computers and computing for those in the humanities and fine arts. Intended especially for those with "computer anxiety" and those who are "anti-computer" or "anti-technology." The course assumes no background in computing, mathematics, or any other technical field. NOTE: This is not a "hands-on" course and there is substantial overlap with M15. Prerequisites: none. Fee: $15.

*"Poets" is meant poetically, not literally.

February 17,18,19,20 12N-1pm [Szoke]

M series: Microcomputers (especially the IBM PC)

M15. Basic Concepts in Computer Information Processing

An introductory survey of computer information processing concepts and terminology, intended especially for those thinking of acquiring a small computer or word processing equipment. The needs of UI administrative, clerical and nonacademic personnel have been central to the planning of the course. Some guidelines for buying a personal or microcomputer are suggested, but attendees will NOT be told which one to buy, nor which one is "best." NOTE that there is no laboratory or "hands-on" component to this course, and that its contents substantially overlaps G23. No prerequisite. Fee: $15.

February 17,19 3pm-5pm [Szoke]

M21. Quick PC

A concise review of essentials of using the IBM Personal Computer: basic hardware configuration (keyboard, system unit, disk drives, printer); proper care and handling of diskettes; hands-on experience using the PC-DOS operating system to format a diskette and to copy, type, rename and delete files; software packages available from CSO and how to check them out; how to load and run BASIC programs and other software packages. Prerequisite: Course G10 and familiarity with basic computer terminology equivalent to one of the following: G23, G25, or M15. Enrollment limited to 15 per section. Fee: $10 (includes one diskette).

1. February 4 3pm-5pm [Knott]
2. February 6 3pm-5pm [Knott]
3. February 10 3pm-5pm [Knott]
4. February 12 3pm-5pm [Knott]
5. February 18 3pm-5pm [staff]
6. February 20 3pm-5pm [staff]

M41. Using a Word Processing Package

How to use a microcomputer (the IBM PC) and word processing package to produce (create, revise and print) publication-ready manuscripts. Prerequisite: Quick PC (course M21) or consent of instructor. Enrollment limited to 12 per section. Fee: $25 (includes one diskette).

1. PC-Write.
   February 11,13,14 12N-1pm [Dewan]
   (plus 2 hours to be announced)

2. Volkswriter Deluxe.
   March 17,18,19,20,21 12N-1pm [Szoke]

M43. Using a Spreadsheet Package

"Electronic spreadsheet" packages (such as VisiCalc, its successors and spinoffs) are widely considered the most impressive and useful software available for microcomputers. This course introduces participants to the analytical and "what if --" capabilities of a new generation

spreadsheet package, Lotus 1-2-3 on the IBM PC. Also, glimpses of this package's database and graphics features if time permits. Prerequisite: M21 or equivalent. Enrollment limited to 15. Fee: $20 (includes one diskette).

1. February 25,27,28 3pm-5pm [Szoke]

2. March 4,6,7 3pm-5pm [staff]

M45. Using a Database Package

An introduction to microcomputer database management emphasizing the fundamentals of using database software. Using dBASE II or III we will design and create an information file, enter, select and sort data, and use the package to write a report. If time permits, we may also write a simple program file in the dBASE language. Prerequisite: M21 or equivalent. Enrollment limited to 15. Fee: $25 (includes one diskette).

1. dBASE II and III March 11,13,14 3pm-5pm [Szoke]

2. R:base 5000 April 1,3,4 3pm-5pm [Szoke]

M61. Using a Decision-aiding Package

A non-technical, hands-on introduction to software designed to process (1) a set of goals to be achieved, (2) alternatives to achieving them, and (3) relations between goals and alternatives in order to choose the best alternative (or combination) in light of the goals, alternatives, and relations. Special concern for dealing easily with multidimensional goals, missing information, overwhelming alternatives, and conflicting constraints. Prerequisite: none. Enrollment limited to 15. Fee: $15 (includes one diskette containing relevant programs and example data).

March 31, April 2 11am-1pm [Nagel]

M63. Instructional Use of Computer-controlled Video

This is a one-hour demonstration of a computer-controlled videodisk system for instructional presentations. Some suggestions will be made on how course planners can begin to develop similar technology for the delivery of instruction. Prerequisite: instructional responsibilities at UIUC. Fee: none.

April 3 4pm-5pm [Smith & Jones]

Statistical Computing

M73. Using a Statistical Package

This course demonstrates how to download a data set from the Cyber system to an IBM PC diskette file. A microcomputer statistical package (probably Microstat) is then used to obtain basic descriptive statistics and do an illustrative regression and analysis of variance. Prerequisite: M21 or equivalent knowledge. Enrollment limited to 15. Fee: $20 (includes one diskette).

April 21,22,23,24,25 3pm-4pm [Mills]

M75. Micro Versions of Mainframe Statistical Packages

Use of the microcomputer versions of SPSS, SAS and BMDP will be demonstrated on the IBM PC/XT and AT. Some points of comparison will be discussed. Prerequisite: M21 or equivalent. Fee: $15.

April 21,23 7pm-9pm [Roy]

C series: The CDC Cyber Network Operating System (NOS)

C11. Introduction to the Cyber System: NOS Version 1

This course is intended for the first time Cyber 175 system user. Covers signing on, obtaining system information, and basic file concepts and maneuvers. The emphasis is on timesharing usage and the ICE text editor. Batch usage may also be discussed. Prerequisite: course G10. Fee: $15. Enrollment limited to 15 per section. Two sections will be offered.

1. February 3,4,5,6,7 12N-1pm [Albin]

2. March 3,4,5,6,7 3pm-4pm [Engelbrecht-Wiggans]

C12. Introduction to the Cyber System: NOS Version 2

This course is intended both for new users who wish to learn about the new NOS Version 2 system on the Cyber 174, and for old Cyber users familiar with the NOS Version 1 system as it continues to run on the Cyber 175. Main features of the course are: use of terminals, Cyber files, the ICE text editor, accounting restrictions, and software presently available on NOS 2. If time permits, new features of CCL (Cyber Control Language) will also be discussed. Prerequisite: G10. Fee: $15. Enrollment limited to 15 per section. Two sections will be offered.

1. February 17,18,19,20 3pm-4:30pm [Pommert]

2. March 17,18,19,20 7pm-8:30pm [Kerr]

C51. Using the UWRIM Database Management System

UWRIM (University of Washington Relational Information Management) is an easy to learn and easy to use database management package based on the relational algebra model of data organization. It can be used to solve a wide range of information handling problems, from everyday office management to scientific and engineering applications. This course shows how to store data in simple tables that can be sorted and accessed in various ways, as well as some applications of UWRIM such as the TAGS mailing list management system. Prerequisite: C11 or C12 or equivalent. Fee: $10.

March 3,5,7 3pm-4pm [Edwards-Iwe]

Computer Graphics

C61. Easy Graphing

Elementary presentation of a high-level interactive plotting program for X-Y plots, bar and pie charts. Its English-like commands require no programming experience to generate plots.

Assumes course C11, C12, or equivalent knowledge. Fee: $10.

February 24,26,28 3pm-4pm [Albin]

C62. Using Blaze Graphics

Blaze is a versatile library of Fortran-callable subroutines for producing X-Y graphs. It is built upon DI-3000, though no knowledge of DI-3000 is necessary for using Blaze. The full range of DI-3000's device-independent functionality is available to the user. Assumes a working knowledge of Cyber Fortran. Fee: $5.

March 10,12 4pm-5pm [Albin]

C63. Introduction to the DI-3000 Graphics Package

DI-3000 is a library of Fortran-callable subroutines for device-independent computer graphics. It is an implementation of the 1979 ACM/SIGGRAPH CORE graphics system proposed standard. This course is for those with little or no experience using DI-3000. It covers capabilities, structure, and basic use of the package. No high level or X-Y plotting capabilities will be presented (see C62). Assumes a working knowledge of Cyber Fortran. Fee: $5.

February 18,20 4pm-5pm [Scheid]

I series: The IBM VM/CMS Systems

I21. Introduction to IBM Timesharing: CMS and XEDIT

This course presents an introduction to general CMS (Conversational Monitor System) virtual machine and XEDIT concepts. The CMS portion covers standard and locally written CMS commands and utilities, sending files between the Cybers and CMS, guidelines for utilizing the available documentation, how to use the full-screen simulator (SIM3278). The XEDIT portion introduces the text editor used under CMS. The presentation covers useful commands for both "ASCII typewriter" and "full-screen" or "simulated full-screen" terminals. Useful locally written XEDIT commands are also discussed. Required reference and recommended prior reading: *CMS Primer*, available at the CSO Distribution Office, 1208 W. Springfield. Prerequisite: course G10 or equivalent knowledge. Enrollment limited to 14. Four sections will be offered. Fee: $15.

1. February 17,18,19,20,21 8am-9am [Mills]
   Lab: February 22 9am-11am

2. February 25,27, March 4,6 4pm-6pm [Alster]

3. March 17,18,19,20 3pm-5pm [Engelbrecht-Wiggans]
   Lab: 2 hours to be announced

4. April 1,3,8,10 7pm-9pm [Roy]

I25. Using the SCRIPT Text Formatter

This course is an introduction to using SCRIPT/VS, IBM's Document Composition Facility, to produce publication-ready documents. The Generalized Markup Language (GML), which

provides a means to describe your document to SCRIPT, is the primary focus of this course. Prerequisite: I23 or equivalent knowledge of CMS and XEDIT. Fee: $10.

March 10,11,13 5pm-6pm [Gengler]

I31. Using BITNET

A brief presentation on how to use the BITNET communications facility, which links some 165 IBM/CMS and RSCS-compatible sites in the USA, Canada, and several foreign countries, and which allows the transmission of files as well as messages. Prerequisite: I23 or equivalent knowledge of CMS and a CMS logon. Fee: none.

February 25 4pm-5pm [Wetzel]

I33. Intermediate CMS

This course is designed for CMS users having at least six months' experience with CMS. Very little introductory CMS material will be reviewed. The course treats in more detail some topics in the introductory CMS course (I23) as well as discussing more advanced topics such as execs, efficient space utilization, an introduction to using magnetic tapes, customizing your CMS work environment, and some commands useful in advanced CMS applications. Enrollment limited to 20. Prerequisite: I23 or equivalent. Fee: $30.

March 11,13,18,20 4pm-6pm [Kesner]

I35. Using Tapes on CMS

the use of magnetic tapes on CMS, including the TAPE command, MOVEFILE, and TBROWSE. Prerequisite: I23 or equivalent experience with CMS. Fee: $10.

April 7,9,11 3pm-4pm [Wetzel]

I37. Using VMBATCH

An introduction to the VMBATCH facility on CMS: how to prepare and submit jobs; job inquiry, status and cancellation; control language to use. Prerequisite: I23 or equivalent basic knowledge of CMS. Fee: none.

1. February 4 4pm-5pm [Kerr]

2. February 12 4pm-5pm [staff]

I51. Introduction to the VM/SP Product Interpreter

This is an introduction to the System Product Interpreter (SPI) under CMS. SPI is a facility which allows you to write programs comprised of CP, CMS, and/or XEDIT commands using one of three languages: EXEC, EXEC2, or REXX (the Restructured Extended EXecutor language). Using SPI, you can write or tailor your own CMS commands (called "execs") or XEDIT commands (called "macros"). You can also write procedures (called "execs") which accomplish a sequence of repeated tasks by simply entering the name of the exec. This course gives an overview of SPI with primary emphasis on the REXX language. Examples will include creating your own PROFILE EXEC and PROFILE XEDIT files. Prerequisites: I23, I71, or the equivalent. Recommended references: *The VM/SP System Product Interpreter User's Guide* and the *VM/SP System Product Editor User's Guide*, available at 1208 W. Springfield. The course

consists of three 2-hour lectures. Fee: $25.

April 22,24,29 4pm-6pm [Kesner]

Statistical Computing

I72. Introduction to BMDP

BMDP, a widely-used package of statistical programs developed by UCLA's Department of Biomathematics, is oriented toward the biological, medical, nutritional, agricultural and veterinary sciences. This is an introductory course on the use of BMDP on the IBM system. Topics covered: data preparation, elements of the BMDP language, running BMDP programs at terminals, data editing, creation and use of system files, and examples of using BMDP for descriptive statistics, regression and analysis of variance. Prerequisite: I23 or I71 or consent of instructor. Fee: $25.

April 7,9 4pm-6pm [Mills]
Lab: April 12 9am-11am

I76. Introduction to SPSSX (Statistical Package for the Social Sciences)

This course is designed to present the basics of SPSSX usage. Topics will include file definition, data input, and sample procedure specification. The emphasis of the course will be on the structure and implementation of SPSSX programs. Examples will be used extensively. Recommended reference: *SPSSX Introductory Statistics Guide*, available from the CSO Distribution Office, 1208 W. Springfield for $14. Prerequisite: I23, I71, or equivalent. Fee: $25.

March 11,13 7pm-9pm [Mills]
Lab: March 15 9am-11am

I79. Repeated Measures Analysis Using SPSS, SPSS-X or SAS

After a review of concepts and terminology useful for understanding SPSS and SAS documentation for repeated measures analyses, examples are presented step by step with emphasis on the interpretation of output. Guidance is provided on choice of contrasts for answering specific research questions and on presentation and summarization of results. Course describes use of SPSS or SPSS-X MANOVA for repeated measures analysis, followed by a discussion of the new REPEATED option in SAS GLM (Version 5). For comparison, the same data are analyzed using SPSS-X MANOVA and SAS GLM. Prerequisite: Some knowledge of analysis of variance and at least minimal experience using a statistical computer package. Fee: $15.

February 18,20 4pm-6pm [Alster]

I83. Introduction to SAS (Statistical Analysis System)

An introduction to SAS processing using the IBM CMS timesharing system. Topics include using SAS interactively and non-interactively, using the DATA and PROC steps, creating temporary and permanent SAS data sets under CMS, reading and writing external data files, using basic SAS procedures, programming in the DATA step, using SAS/FSP (the SAS Full-Screen Product) to interactively edit SAS data sets, highlights of other SAS/FSP features, and an overview of CSO SAS features and services. Prerequisite: I23, I71, or equivalent knowledge of

CMS and XEDIT. Recommended references: *SAS Introductory Guide* and the *SAS Companion for the VM/CMS Operating System.* Fee: $20.

February 24,26 7pm-9pm [Dingler]
Lab: March 1 10am-11am

I84 Orientation to SAS Version 5

SAS Institute, Inc., has recently released Version 5 of the CMS SAS system. A preliminary introduction to newly released products will be given, along with a description of the full-screen interactive editor called Display Manager. Prerequisite: I23, I83, or equivalent. Fee: $5.

January 29 7pm-9pm [Dingler]

I91. Introduction to the Time Series Processor (TSP) Package

This course is designed to present the basics of TSP usage in a lecture-lab format. Topics will include the TSP command language structure, data preparation and file usage in TSP, using TSP data banks for storage and retrieval of variables, interpretation of TSP output, and how to use the matrix capability of TSP to program your own estimators. Examples will be used extensively to illustrate the programming capability of TSP. The course assumes familiarity with IBM-CMS as well as some basic statistics and econometrics. Recommended Reference: *TSP User's Guide, Version 4.0.* Prerequisite: I23 or equivalent knowledge of CMS. Fee: $20.

April 1,2,3 7pm-9pm [Edwards-Iwe]

Statistical Package Graphics

I98. Introduction to CMS SAS/GRAPH

An introduction to using SAS/GRAPH on the IBM CMS timesharing system and CMS/SAS. Topics include: how to use SAS/GRAPH with various graphics devices, how to produce hard-copy Zeta plots from SAS/GRAPH output, global features of SAS/GRAPH, using map data sets, calculating dimensions and proportions for Zeta plots, and highlights of new features in SAS/GRAPH. Prerequisites: I23 and I83 or equivalent knowledge of CMS, XEDIT, and SAS. Fee: $15.

March 31, April 2 7pm-9pm [Dingler]

I99. The SAS/GRAPH Annotate Facility

An introduction to using the newly developed SAS/GRAPH Annotate facility on the IBM CMS timesharing system. The Annotate facility is used to enhance graphics output. Two functions allow moving and drawing; others are used to position labels. With these functions one can overlay text on complex graphs, maps and plots. Annotate variables, functions and coordinate systems will be introduced. Several examples will be presented and explained. Prerequisites: I23, I83 and I98 or equivalent knowledge of CMS, XEDIT, SAS, and SAS/GRAPH. Fee: $15.

April 14,16 7pm-9pm [Dingler]

U series: The UNIX System

U11. Introduction to the UNIX System

This course introduces the new user to the UNIX timesharing system. It covers terminal setup, logging in and out, file commands, and useful utility programs. It also discusses how to set up a file directory, how to communicate with others through the "mesg" and "mail" facilities, and how to use the on-line help programs. Prerequisite: G10. Enrollment limited to 15. Fee: $10. Two sections will be offered.

1. March 4,6 7pm-9pm [Pommert]

2. April 7,9 7pm-9pm [Edwards-Iwe]

U31. UNIX Text Processing

This course covers the "command mode" and "insert mode" for both the line-oriented "ex" editor and the screen-oriented "vi" editor. In ex, command structure and addressing along with the most useful editing commands are presented. The basics of vi are discussed along with learning how to physically move through files and around the terminal screen. Use of the nroff and troff text formatters and typesetter is then considered. Prerequisite: U11 or equivalent. Enrollment limited to 15. Fee: $15.

1. March 11,13 7pm-9pm [Dewan]

2. April 14,16 7pm-9pm [Scheid]

U41. Intermediate UNIX

An explanation of shell concepts is given: pipelines, filters, tees, background processing, subshells, and redirecting input-output. Features specific to the C and Bourne shells are covered. The UNIX "make" utility will also be discussed. Prerequisite: U11 or equivalent. Enrollment limited to 15. Fee: $15.

1. April 1,3 7pm-9pm [Pommert]

2. April 21,23 7pm-9pm [Pommert]

Statistical Computing

U73. The S Package for Data Analysis and Graphics

S is an interactive statistical environment available on UNIX machines. It comprises a high-level language for specifying computations and a support system for data management and graphics. This introductory course provides an overview of S commands and an exposure to the S environment. The flexibility and graphical capabilities of S will be stressed. The course is divided into lecture/discussion and hands-on sessions using S. Recommended references: R.A. Becker and J.M. Chambers, *S: An Interactive Environment for Data Analysis and Graphics*; J.M. Chambers and others, *Graphical Methods for Data Analysis*. Prerequisite: U19 or equivalent and a good grasp of basic statistical analysis. Enrollment limited to 15. Fee: $25.

April 15,17,22,24 7pm-9pm [Richardson]

X series: Mixed and Other Systems

X37. Using VMBATCH under CMS from the Cyber

An introduction to the features of the VMBATCH facility on CMS, which enables a Cyber user to submit a batch job to the IBM CMS system. Prerequisite: C11 and I23 or equivalent; Cyber and CMS signons. Fee: none.

1. February 5 4pm-5pm [Kerr]
2. February 11 4pm-5pm [staff]

Statistical Computing

X77. Using SAS with VMBATCH from the Cyber

VMBATCH can be used to submit SAS jobs from the Cyber. This course will introduce the necessary job control and programming statements for this type of processing. Since VMBATCH is used under the CMS operating system, an explanation of the file naming scheme and disk management techniques will be given. Prerequisite: C11 and I83 or equivalent. Fee: $5.

February 3 7pm-9pm [Dingler]

X81. Using the SHAZAM Econometric Package

SHAZAM is an integrated package useful to econometricians, statisticians, engineers and others who use techniques common to econometrics. SHAZAM is relatively easy and inexpensive to use, and provides a great deal of flexibility in data formats. It has primary capabilities in regression analysis, simultaneous equation estimation, and principal components. Secondary capabilities are in factor analysis, analysis of variance, sorting and plotting variables. It also provides extensive data manipulation features and can generate various random probability distributions and a Divisia price index. This course covers how to run SHAZAM on the Cyber and IBM-CMS systems, as well as interpretation of the output. Prerequisite: C11 or C12 or I23 or equivalent. Fee: $15.

April 22,24 3pm-5pm [Edwards-Iwe]

MANUALS

Access to the following manuals is strongly recommended for certain short courses. These documents may be purchased individually at the Illini Union Bookstore (Reference Section), 715 South Wright Street, or may be purchased as a set at the CSO Distribution Office, 1208 W. Springfield.

1. Introduction to the Cyber Systems, $2.00
2. A Tutorial Guide to the ICE Text Editor, $1.25
3. ICE Reference Manual, $3.25
4. RNF Documentation: Tutorial, Macros and Reference, $4.00 (NOTE: This manual is not included in the package; it must be purchased separately.)

5. An Index to Software on the Cyber, $3.25

6. Cyber Fortran Debugging, $1.25

NOTE: Manuals for NOS 2 are available free at the CSO Distribution Office.

TRAINING CASSETTES

CSO makes available to the user community nineteen videotape training cassettes: three introducing the Cyber system, six on the fundamentals of using SAS (Statistical Analysis System), and ten on SAS color graphics (SAS/GRAPH). The tapes may be obtained at the Media Desk in the Undergraduate Library (upper level, in back). Show your University ID to the clerk on duty there and state the title of the videotape you wish to use. If a machine is available, you will be taken to a room containing the videotape equipment and shown how to operate it. If all machines are in use you can make a reservation for a later time.

CSO Videotapes

CSO has produced a series of three videotapes (comprising eight segments) which introduce the novice to computing on the Cyber system. A viewing guide containing the major displays in this series is available and can be used to facilitate note taking. Ask for your free copy of the viewing guide when you check out any of these videotapes for viewing.

The title and a brief synopsis of each segment is given below. Running time is 10 to 15 minutes for each segment.

1. **CSOVT1.**
   1.1 Introduction to Computing at CSO: A brief look at the steps required to solve a problem using a computer, and at some of the hardware used.

2. **CSOVT2.**
   2.1 Using a Terminal: A description of the physical operation of a terminal and some of the keys that have a special meaning to the Cyber.

   2.2 Introduction to Cyber Timesharing: A tutorial on logging on and off the Cyber.

   2.3 File Usage: Local files and indirect access to permanent files. An introduction to Cyber files and the commands used to manipulate them.

   2.4 Introduction to ICE Text Editing: A tutorial on entering and modifying files with ICE.

3. **CSOVT3.**
   3.1 Running a Fortran Program: Concepts. A discussion of the concepts of compilation, loading and execution.

   3.2 Running a Fortran Program: The PROGRAM statement. A discussion of the PROGRAM statement and its relationship to files accessed by the program.

   3.3 Running a Fortran Program: Control Statement. A discussion of the control statements used to compile, load, and execute a Fortran program.

A copy (Beta-1 format) of these videotapes is available for loan from CSO to any instructor wishing to use them in class. They have been effectively used in this environment several times recently, with the instructor stopping the playback equipment whenever he/she wished to elaborate further or questions arose from the class. To borrow a videotape for classroom use and obtain copies of the viewing guide for class distribution, call the CSO training coordinator: Ron Szoke, 333-8630. If you do not already have access to the required videotape equipment, Betamax viewing equipment can be borrowed from the Office of Instructional Resources, 333-3690.

SAS Videotapes

CSO has leased the SAS Basics 100-Series video training course. The course combines video and workbook media to deliver performance-based SAS training. The information in the course is contained in six videotapes.

The videotaped instruction is not complete without the workbook, which contains exercises and illustrations to reinforce the material presented in the videotapes. A copy of the workbook is available for reference at the Media Desk. You may, however, wish to obtain a personal copy of the workbook to complete the exercises, to take notes, and to use as a reference after the course is completed. The workbook may be purchased for $8.00 at the CSO Distribution Center, 1208 West Springfield, Urbana.

NOTE: The SAS videotapes are not available for loan.

The title of each of the videotapes is given below. Running time is about 45 to 60 minutes for each tape.

B101. Introduction to SAS.

B102. Getting Your Data Into a SAS Data Set.

B103. Program Processing.

B104. Working with SAS Data Sets.

B105. Report Writing.

B106. SAS procedures.

A Cyber terminal user may obtain more information about each via:

```
TYPE,SASVID/AS/UN=COURSES.
```

The Media Desk also has the ten tapes in the SAS color graphics (SAS/GRAPH) series and a reference copy of the student workbook. For more details:

```
TYPE,SASGRAF/AS/UN=COURSES.
```

Audio Cassettes

CSO makes available to the user community three sets of audio cassette tapes for the training of microcomputer users:

1. How to Operate the IBM Personal Computer (on 3 cassettes)

2. How to use MultiMate (3 cassettes)

3. How to use Lotus 1-2-3 (4 cassettes)

These cassettes, with accompanying printed materials, may be borrowed for up to one week by contacting Ron Szoke, 333-8630.

CONSULTING SERVICES

ECONOMETRICS CONSULTING AND COMPUTING

L. Auslender

I will be keeping office hours on Monday and Wednesday from 1:30 pm to 3:30 pm at 85 Commerce West. Users with problems or questions about econometrics and computing are welcome. You may also request special appointments by calling 333-2170 during the above hours, or by sending a note on VMD via NOTE LEONARDO.

STATISTICAL SERVICES

SPSSX ON THE CYBER 174 (NOSB)

Bruce C. Richardson

SPSSX, the Statistical Package for the Social Sciences - Extended, is now available on the Cyber 174 (NOSB). Due to memory limitations SPSSX has been available only under batch processing. An upcoming memory upgrade for NOSB will allow users to access SPSSX in timesharing on a very limited basis (please talk to our Statistical Consultants before attempting to use this program, due to the large memory requirements). This document provides the basic information necessary for running an SPSSX job on NOSB. Details about SPSSX may be obtained by purchasing SPSS's documentation, *SPSSX Introductory Statistics Guide* or *SPSSX User's Guide* (available at CSO Distribution Center, 1208 W. Springfield Ave., Urbana).

The first steps necessary in running SPSSX on NOSB are to create a program file, raw data set, and possibly a batch control program. The program file contains the commands, subcommands and procedure calls of the SPSSX language. The data set may be contained in the program file or in a separate file. When the raw data reside in a separate file, your program must include the command:

```
FILE HANDLE yrhand
```

where **yrhand** is the name of the raw data file.

SPSSX Under Batch

The batch control program, which contains the Cyber commands that make your SPSSX program and data files local, makes SPSSX available and invokes SPSSX. The next paragraph describes this batch control program in more depth. Once all files have been created, you SUBMIT your job by issuing the command:

```
SUBMIT,lfn,TO.
```

where **lfn** is the name of the file containing your batch job. The **TO** option causes system output from the job to be placed into your wait queue. Upon submission, your job will be assigned a job sequence name or JSN. To check on your job's progress, issue one of the commands:

```
ENQUIRE,JSN.
```

or

```
ENQUIRE,JSN=jsn.
```

The first command asks for a listing of all your jobs and the second asks for detailed information on your job with name (JSN) **jsn**. When your job is finished, job output will be waiting in your wait queue. To access this output, issue the command:

```
QGET,jsn.
```

This command places the results file (**jsn** will be its name) into your local file space where you can ICE, TYPE, SAVE, or PRINT it. All files that you created and saved in your batch program will be accessible at this time.

The batch control program is simply a collection of the commands you would issue at the terminal. Below is an example program which will run an SPSSX program.

```
/JOB
/NOSEQ
AJOB.
/USER
CHARGE,charge ,project .
GET,xprog,xdata.
GRAB,SPSSX.
SPSSX,I=xprog,L=list.
SAVE,list.
```

In this program the **xprog** and **xdata** specify your SPSSX program and data file names respectively. Your results will be in the file named **list**. The /USER command provides the system with all the necessary logon information to process your job. The job will be charged to the account given on the CHARGE command, or to your default account if you use CHARGE,* in place of the CHARGE command shown above. You will have to add to this program the saving and getting of any other files (such as systems or matrix) that are required as input or are produced as output.

Reminder for Cyber SPSS users: In SPSSX the data file is identified using a FILE HANDLE command in the SPSSX program, not by a D=option on the SPSSX command.

SPSSX in Timesharing

In order to run an SPSSX program at your terminal you need to first create an SPSSX program file, e.g. **xprog**, and a data file, e.g. **xdata**. Next you must access SPSSX by issuing the command:

```
GRAB,SPSSX.
```

Note that you need only issue this command once per session. Finally, to run your program issue the command:

```
SPSSX,I=xprog,L=xoutput.
```

This command will cause SPSSX to process your program. Any results or error messages will be written to the file **xoutput**.

Finally, the SPSSX command has many optional parameters which have not yet been discussed; they are:

W=n	n is the number of words to be allocated for workspace. The default workspace is 5000 words.
WB=m	m is the number of words to be reserved for system buffers and dynamically loaded code. The default of 1500 words is sufficient for most jobs with only one system or raw input data file. For each additional file, add 600 to the base value of 1500.
PW=pw	pw is the page width. The default width is 132 columns.
PS=ps	ps is the page size. The default length is 66 lines.

These options would follow the L= specification on the SPSSX command. For further details about these and other options, you must run a job which includes the following command:

```
INFO LOCAL
```

The output from this job describes many aspects of running SPSSX jobs on NOSB.

On-line Help for SPSSX

On-line help for SPSSX is available through the EXPLAIN facility. To enter this facility issue the command:

```
EXPLAIN,M=SPSSX.
```

The EXPLAIN facility is easy to use; your first command in EXPLAIN should be HELP. In reply the facility will give you all the information you will need to use it successfully.

SPSS GRAPHICS IS HERE

Joan Mills

The newest graphics product from SPSS has been installed on the IBM timesharing system on VMD. SPSS Graphics is an interactive, menu-driven product that is compatible with SPSSX system files and

allows users to produce charts (black & white or up to 8 colors), including the following:

Pie charts	radial or conventional (with or without exploded sectors)
Bar charts	simple, grouped or stacked, compositional, range or population pyramids
Line charts	simple and multiple lines, also area and projection line charts
Statistical plots	histograms, scatterplots, with or without regression lines
Maps	choropleth maps and prism maps with options for projections, angles and resolution
Text pages	fonts include simplex, complex, duplex, triplex, Greek and SPSS Heleos (a bold face)
Combined images	combinations of the above either side by side or overlaid

This product is documented in a volume called *SPSS Graphics* published by McGraw Hill. The manual is available from the CSO Distribution Center, 1208 W. Springfield, Urbana.

SPSS Graphics may be used from regular terminals (known as alpha terminals) or graphics terminals (such as the Tektronix 4105 or the IBM 3279). If run from an alpha terminal, the user must save the graphics output file to be run later on a graphics device (same as sending graphics output files to the Zeta). Users will need to specify to the program the type of alpha terminal they are logged onto, and later, the graphics device they will use to produce the graphic output. Note also that possible PF choices are shown at bottom of the screen.

To run SPSS Graphics on VMD for eventual drawing on a non-IBM graphics terminal, type:

```
LINKTO SPSSGRAF
SPSSGRAF
```

If you intend to use an IBM graphics device (such as the IBM 3279) to draw your plots, you must access the product as follows:

```
LINKTO SPSSGRAF
SPSSGRIB
```

where the IB in SPSSGRIB specifies IBM. We recommend that users try a quick test using the test library supplied by SPSS. The author also recommends that users start out by using one of the graphics terminals connected to VMD to try the program. The author has done tests using the Tektronix 4105 and the IBM 3279, and the test program worked well on both. Do not use a full-screen emulation on the 4105, however, because the SPSS Graphics program does not seem to work correctly using the emulation mode.

After you have initiated the program, the MAIN MENU will appear on your screen. You may type &HELP to obtain the HELP MENU. Alternatively, you may press the return/enter key to move the pointer to a particular item on which you want help and then type ? or ?? (two ?? provide more detailed help than one ?). Throughout the program, use the return/enter key to move the pointer (the pointer is an asterisk, *), enter commands at the command line, or clear messages, and use the PF keys to make selections from the menus.

To run a quick test from the SPSS Graphics test library, using a graphics terminal on VMD, you do the following steps:

1. Select the device you are logged onto (if you are using a Tektronix 4105, you select no. 1; if you are using an IBM 3279, you select no. 4). Type 1 or 4, then press return/enter to proceed.

2. From the MAIN MENU select item 8 (assign libraries). To do this, move the pointer (using the return/enter key) to item 8 and then press the PF1 key.

3. On the ASSIGN LIBRARIES MENU move the pointer to item 2, then type TEST on the command line and press return/enter key. Return to the MAIN MENU by pressing the PF2 key.

4. On the MAIN MENU move the pointer to item 7 for library picture -- select by using PF1. (Note that the pointer cycles through the menu rather than reversing.)

5. On LIBRARY PICTURE screen, the pointer should be positioned at item 1; select by pressing PF1. Select graphics device on the select screen which appears by positioning pointer on item 1, then typing the device number (33 for the Tektronix 4105, or 23 for the IBM 3279) on the command line and pressing the return/enter key.

6. Return to LIBRARY PICTURE screen by pressing PF3. Put the pointer on item 2, and select by pressing the PF1 key.

7. On the SELECT LIBRARY PICTURE screen, type PICTTEST on the command line and press return/enter key.

8. Note that the "draw" potential exists (see lower right of screen). Since you are using a graphics terminal, press PF8 to display picture. Press the return/enter key to clear picture from screen.

9. To exit the program, return to MAIN MENU by pressing the PF2 key and then type &QUIT on the command line (followed by pressing the return/enter key).

The preceding has illustrated a quick route through the procedure. Other routes may be taken if data is to be prepared, default parameters adjusted, headings and labels added to the plots, or plots saved for later display. Future *OFF-LINE* articles are planned to explain more features of SPSS Graphics and to show other examples of how the program may be used.

MICROCOMPUTER SERVICES

WORD PROCESSOR REVIEW

Ed Dewan

Following is the first of a series of review articles on word processors, which will appear in Off-Line from time to time as the material becomes available. The articles are prepared by the Text Processing Consulting Office (333-7318), and will cover those word processors which have been found to meet some special need of the University community. (At present, candidates for future articles are Nota Bene, T3, Microsoft Word, and Edix-Wordix.)

PC-Write
Quicksoft
219 First N 224
Seattle, WA 98109
Phone: 206-282-0452
Price: $10 from vendor, $75 with registration, may be freely copied
Version: 2.55
Date: 1/12/86

PC-Write is an unusual word processor. It is sold through the "shareware" concept - it may be freely copied and distributed (available from the vendor for $10), and if you like it you can register it for the modest fee of $75. Registration gives you 1 year full support: a printed manual, telephone support, quarterly newsletter, quick reference card, and two free diskettes for new updates or source (Pascal and assembly); there is additionally a $25 commission when someone else registers from a copy of your registered diskette. Organizations needing several copies of the program can register one copy, and then buy copies of the manual at reduced rates ($20 for one, $15 for 5 to 49, $10 for 50 or more). For registered owners, support can be renewed for one year for $35. Also, there are quantity discounts on the program itself.

PC-Write, although very low in cost even if you register your copy, is a very capable program, with new features being added continually. Following is a summary of features contained in version 2.55:

- Cursor movement - character, word, line, paragraph, tab, start/end of line or text, screen edge, scroll by line, paragraph, screen, horizontal scroll, bookmark, jump to top/bottom of file.

- Search and Replace - forward, backward, wild card, lower case matches upper, replace singly or to end of text, un-replace, replace matches case.

- Editing - insert in pushright or overwrite mode, decimal tab to align numbers, delete character, word left or word right, to end of line, beginning of line, entire line, un-delete, wordwrap, margin release, entered text aligned with previous text, insert/delete space, slide block left/right, transpose characters, change case, center text.

- Block operations - move, copy, delete (any length marked text), to file, from file, un-delete.

- Margins - left, right, paragraph, bell margins, temporary left and right, optional ruler line can be edited, ruler file can be edited, reformat paragraph, reformat modes ragged right, justify both (left and right), un-justify. Flush right text planned for next version.

- File operations - save text, switch files, rename text, cancel save, edit, two windows via ruler line, DOS 2.00 path support. Exit to DOS shell command (can run multiple copies of the editor as memory permits) allows DOS operations such as print, directory listing, delete files, rename files, copy files, etc., after which return to PC-Write with EXIT command.

- Merge - merge input file records with model document for form letters, labels, invoices, interactive or continuous, empty field prompt or delete, blank pad/reformat after substitution.

- Page breaks - show current and maximum line on page, page in text, line in file, column, hard and soft page breaks, repage operation to reset soft breaks.

- Fonts - Underline, boldface, subscript, superscript, pica and elite correspondence and draft quality, more according to printer (overstrike, second strike, proportional spacing, double underlining, compressed, expanded, italic).

- Layout - Endnotes or notes to file, footnotes, running heads and foots with the usual stuff (page numbers, odd/even, etc.), text keeps, multiple spacing and lines per inch, set/clear current fonts, set page length and margins. Index/table of contents entries to file.

- Print - single sheets, to file, chain print, include user commands/text, translate characters to printer commands for custom foreign/scientific text. Can print marked text in file, multiple copies, skip pages, from DOS or within file.

- Keyboard - redefine key to be sequence or phrase, sticky shift for one-finger typing, record/playback keystrokes, re-program keyboard.

- Display - Monochrome, single color, or multi-color mode, customize attributes, status line and 24 editing lines, font character visible/invisible mode.

- Help - keyboard summary screen plus eight optional tutorial screens, in a user-editable file (reside in memory at runtime).

- Files - ASCII standard DOS files, Ctrl-Z option, 60 KB max file size.

- Computers - IBM PC/XT/AT/JR, COMPAQ, etc. One double-sided drive, 128 K preferred.

- Printers - Over 200 printers supported - IBM, Epson, Okidata, Diablo, NEC, HP, Toshiba, many others (can customize).

- Miscellaneous

  - ✓ Ins key adds blank(s) without moving cursor; this is very useful for pushing blanks into columnar data. (Scroll Lock toggles Pushright/Overwrite modes.) Can modify RULER.DEF file to enable push text to tab stop in pushright mode.

  - ✓ Emulates many Wordstar control key functions.

  - ✓ Mouse support with pop-up menus (Microsoft, Mouse Systems).

  - ✓ Dot commands for printer control and others.

  - ✓ Includes commands to inhibit and restart formatting, so that tables and other displays will not be affected.

  - ✓ Can insert image or figure file when printing.

  - ✓ A paragraph end character can be assigned for use by postprocessors.

  - ✓ Text files can be uploaded to CYBER for printing on the Xerox 2700 laser printer, provided they contain no special font characters (plain text), using the Cheng communications package.

Now for the bad news, which isn't really so bad. Following is a list of idiosyncracies that were considered by the reviewer to be noteworthy:

- Key assignments sometimes do not seem logical or consistent, especially after experience with other programs. For example, upon entry to create a new file, the Esc key cancels the edit and

takes you back to DOS, whereas to edit an existing file the Esc key is used to enter the edit without making a backup copy. I found this very confusing until I had it thoroughly learned. A side effect of this is that if you want to cancel an edit on an existing file at the beginning, you have to go into the edit without making a backup copy (Esc), and then do FI-F2 to get out, instead of simply doing Esc once. (This has been fixed in Version 2.6, now in testing stage.)

- A second window can be opened with the F2 key, which displays the ruler line with the cursor in it; you then move the cursor down into the bottom window, at which point you can view different parts of the file simultaneously, or switch to another file. Whenever you have two files open this way, pressing the F2 key takes you from the window you are in to the ruler line, and then the uparrow or downarrow keys take you across the boundary into the other file. When this is done, the old file is written to disk, so the edit is not lost. However, when you want to cancel a window, you use F2 to go to the ruler line, and then press F2 again. The surprise comes when PC-Write cancels the window TOWARD WHICH YOU ARE MOVING, and not the one which you just left. In order to leave and cancel the window you are in, you must move to the ruler line with F2, move to the other window with the appropriate cursor key (and wait for the write operation to take place), and then do F2-F2 to cancel the window which you have recently vacated. A much better scheme would be simply to have F2-F2 delete the window you are currently leaving, with a confirmation trap to assure a write to disk only if desired, and then leave you in the "other" window (which is by now the whole screen).

- Ruler lines are not embedded in the file, so there is only one ruler line. A ruler file can be read in at will, but the reverse is not true, except via direct editing in a separate window. (Note: Version 2.6 will include automatic formatting, embedded ruler lines, and the ability to write the ruler line to disk.)

- Help screens are very dense and terse, but to compensate the user can edit them at will. All 9 screens have to be scanned in sequence; it would be nice if they could be selected arbitrarily by number.

- The marking scheme is unusual in that a separate key is used to mark for different operations (move, copy, delete, etc.), instead of a single key to mark a block of text, and then separate keys to move, copy, delete, etc. This is the way marking is defined; actually, once a block of text is marked for one operation, a different operation can be performed on it simply by using the appropriate second key. For example, a move operation is normally done with F6-F6-F6, and a delete operation is normally done with F4-F4. On the other hand, you can start marking a block with F6, intending to move it somewhere, and then use F4 to delete the highlighted text, use F3-F3 to copy it somewhere instead, etc.

- Due to use of BIOS routines, user cannot re-assign the NumLock, ScrollLock, and CapsLock keys.

- Cannot handle very large files; version 3.0 will have larger file handling capability.

- Single-line scrolling with the PgUp and PgDn keys is visually annoying, since the whole screen jumps by one line. Other screen refresh operations are instantaneous.

- Status information on CapsLock, ScrollLock, NumLock, and other functions is confused by overwriting rather than having all the information separately displayed; at least three different cursor sizes are used, with ambiguous meanings.

HELP WANTED AND SALES

STUDENTS NEEDED AS MICROCOMPUTER CONSULTANTS

CSO is now hiring a staff of microcomputer consultants and has several positions available for qualified students. If you are a student and are interested in working as a microcomputer consultant, please contact Jack Knott, 333-6562.

FOR SALE - GANDALF MINI-PACX III

For sale: Gandalf Mini-Pacx III, RS-232 data switch. Configured for 36 terminals X 24 computer ports, expandable to 48 X 48. $4000 or best offer. Contact Mark Sandrock, Box 66 Noyes Lab, 244-0560.

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department

_____

Room - Building

Off-campus Address:

_____

Organization or Company (if applicable)

_____

Street Address

_____

City -- State -- Zip Code

If address correction, give old address and zip code below.

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University of Illinois at Urbana-Champaign VOL. 14, NO. 2/3 February-March 1986

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Text Processing Consulting	**212**	**CSOB***	**333-7318**
Maintenace & Repair Service	**194**	**DCL**	**333-0969**
Tape Service, Special Plots, Xerox Laser Printer	**123**	**DCL**	**333-8640**

Dial-up Numbers	**CYBER 175 (NOSA)**	**300**	**baud**	**333-4000**
	CYBER 174 (NOSB)	**300**	**baud**	**333-4004**
	IBM 3081 GX (VMD)	**300**	**baud**	**333-4006**
	Switch	**1200**	**baud**	**333-4008**
	TELENET (local no.)			**384-6428**

CSO STAFF

Director	George Badger	150	DCL	333-4103
Business Manager	Stanley Rankin	150	DCL	333-6530
Secretary	Joyce McCabe	150	DCL	333-1637
Networking	Sue Greenberg	187	DCL	333-3723
Systems & User Services	Ahmed Kassem	185	DCL	333-7159
Hardware Maintenance & Communication	Mike Gardner	173	DCL	244-0914
Personal Computers/EXCEL	Robert Penka	119	CSOB*	333-4709
Supercomputer Activities	Sandra Moy	1207	W Springfield	333-9772
Maintenance	Larry Crotser	131C	DCL	333-5190
Consulting	Stan Kerr	208	CSOB*	333-4715
Statistical Services	Joan Alster	202	CSOB*	244-0937
Accounting Services	Gary Bouck	1208	W Springfield	333-7752
Microcomputer Laboratory	Jack Knott	102	CSOB*	333-6562
User Training (Short Courses, Videotapes)	Ron Szoke	108	CSOB*	333-8630
Documentation	Lynn Bilger	207	CSOB*	333-6236
CYBER-IBM-VAX Operations	Myra Williams	168	DCL	244-0186
Site Operations	Sylvia Hansen	65	ME	333-6285

*CSOB is the new CSO Office Building, 101 S. Gregory, Urbana.

CSO Sites (see Reference Guide RF-0.3 for operating hours)

Agriculture	N-120	Turner Hall	333-8170
Chemistry	153	Noyes Lab	333-1728
Commerce West	70	Comm West	333-4500
CRH Snack Bar	120	Snack Bar	333-1851
DCL Routing Room	14	DCL	333-6203
Electrical Engineering	146	EEB	333-4936
Florida Ave Res Hall		FAR	333-2695
Illinois St Res Hall		ISR	333-0307
Mechanical Engineering	65	MEB	333-1430
Psychology	453	Psych Bldg.	333-7815
Social Science	202	Lincoln Hall	333-0309

OFF-LINE is the monthly newsletter of the Computing Services Office at the University of Illinois at Urbana-Champaign. Unless otherwise indicated, permission to reprint is freely granted, provided that the author, if named, and the Computing Services Office (CSO) are credited. Information in this issue is current as of March 14, 1986.

Academic and research computing is done on the following machines: CDC Cyber 175 running NOS 1; CDC Cyber 174 running NOS 2; IBM 3081 running VM; IBM 4341 running VM; VAX 11/780 running UNIX and driving a GSI CAT-8 phototypesetter; three Pyramids a dn a Sequent running UNIX. In addition CSO serves as Facility Manager for various departmental machines (e.g., other IBMs) and for the National Center for Supercomputing Application's CRAY X/MP.

Operating Hours (see HEARYE,SCHEDUL for exceptions):

	CYBERS 174/175	IBM
M-F	8 am - 6 am	8 am - 6 am
SAT	8 am - Midnight	8 am - 6 am
SUN	Noon - 6 am	Noon - 6 am

POLICY

COMMUNICATIONS PROBLEM REPORTING

There is often confusion in knowing whom to call when a terminal, whether it be privately owned or one of CSO's terminals, malfunctions. CSO provides a communications problem hotline, which should be called to report any terminal or communication problem, or to inquire about any service or previously reported problem. This "hotline" telephone number is **333-0969**. It is staffed from 7am to 11pm by personnel trained in communication problem isolation (and some correction). Problems that cannot be corrected through the process of isolation will be passed on to the most appropriate group within CSO to look into the problem in more depth. Between 11pm and 7pm the telephone will be answered and the problem recorded, but initial problem determination will be done by a technician as he becomes free.

SHORT COURSES OFFERED IN APRIL

A brief reminder of the short courses that will be offered by CSO during the month of April (a copy of the registration form is included at the end of this issue for your convenience):

G series: General and Introductory

G18. Data Communications and Networking

This class will discuss: connecting a terminal to a computer both locally and remotely; long distance communication media; EIA RS232 standard interface wiring; modems; multiplexing; file transfer between computers and the software available for accomplishing this. Assumes M15 or equivalent knowledge of computer fundamentals. Fee: $10.

April 7,9,11 3pm-4pm [staff]

M series: Microcomputers (especially the IBM PC)

M45. Using a Database Package

An introduction to microcomputer database management emphasizing the fundamentals of using database software. Using dBASE II or III we will design and create an information file, enter, select and sort data, and use the package to write a report. If time permits, we may also write a simple program file in the dBASE language. Prerequisite: M21 or equivalent. Enrollment limited to 15. Fee: $25 (includes one diskette).

2. R:base 5000 April 1,3,4 3pm-5pm [Szoke]

M61. Using a Decision-aiding Package

A non-technical, hands-on introduction to software designed to process (1) a set of goals to be achieved, (2) alternatives to achieving them, and (3) relations between goals and alternatives in order to choose the best alternative (or combination) in light of the goals, alternatives, and

relations. Special concern for dealing easily with multidimensional goals, missing information, overwhelming alternatives, and conflicting constraints. Prerequisite: none. Enrollment limited to 15. Fee: $15 (includes one diskette containing relevant programs and example data).

March 31, April 2 11am-1pm [Nagel]

Statistical Computing

M73. Using a Statistical Package

This course demonstrates how to download a data set from the Cyber system to an IBM PC diskette file. A microcomputer statistical package (probably Microstat) is then used to obtain basic descriptive statistics and do an illustrative regression and analysis of variance. Prerequisite: M21 or equivalent knowledge. Enrollment limited to 15. Fee: $20 (includes one diskette).

April 21,22,23,24,25 3pm-4pm [Mills]

M75. Micro Versions of Mainframe Statistical Packages

Use of the microcomputer versions of SPSS, SAS and BMDP will be demonstrated on the IBM PC/XT and AT. Some points of comparison will be discussed. Prerequisite: M21 or equivalent. Fee: $15.

April 21,23 7pm-9pm [Roy]

I series: The IBM VM/CMS Systems

I23. Introduction to IBM Timesharing: CMS and XEDIT

This course presents an introduction to general CMS (Conversational Monitor System) virtual machine and XEDIT concepts. The CMS portion covers standard and locally written CMS commands and utilities, sending files between the Cybers and CMS, guidelines for utilizing the available documentation, how to use the full-screen simulator (SIM3278). The XEDIT portion introduces the text editor used under CMS. The presentation covers useful commands for both "ASCII typewriter" and "full-screen" or "simulated full-screen" terminals. Useful locally written XEDIT commands are also discussed. Required reference and recommended prior reading: *CMS Primer*, available at the CSO Distribution Office, 1208 W. Springfield. Prerequisite: course G10 or equivalent knowledge. Enrollment limited to 14. Four sections will be offered. Fee: $15.

4. April 1,3,8,10 7pm-9pm [Roy]

I35. Using Tapes on CMS

the use of magnetic tapes on CMS, including the TAPE command, MOVEFILE, and TBROWSE. Prerequisite: I23 or equivalent experience with CMS. Fee: $10.

April 7,9,11 3pm-4pm [Wetzel]

I51. Introduction to the VM/SP Product Interpreter

This is an introduction to the System Product Interpreter (SPI) under CMS. SPI is a facility which allows you to write programs comprised of CP, CMS, and/or XEDIT commands using one of three languages: EXEC, EXEC2, or REXX (the Restructured Extended EXecutor language). Using SPI, you can write or tailor your own CMS commands (called "execs") or XEDIT commands (called "macros"). You can also write procedures (called "execs") which accomplish a sequence of repeated tasks by simply entering the name of the exec. This course gives an overview of SPI with primary emphasis on the REXX language. Examples will include creating your own PROFILE EXEC and PROFILE XEDIT files. Prerequisites: I23, I71, or the equivalent. Recommended references: *The VM/SP System Product Interpreter User's Guide* and the *VM/SP System Product Editor User's Guide*, available at 1208 W. Springfield. The course consists of three 2-hour lectures. Fee: $25.

April 22,24,29 4pm-6pm [Kesner]

Statistical Computing

I72. Introduction to BMDP

BMDP, a widely-used package of statistical programs developed by UCLA's Department of Biomathematics, is oriented toward the biological, medical, nutritional, agricultural and veterinary sciences. This is an introductory course on the use of BMDP on the IBM system. Topics covered: data preparation, elements of the BMDP language, running BMDP programs at terminals, data editing, creation and use of system files, and examples of using BMDP for descriptive statistics, regression and analysis of variance. Prerequisite: I23 or I71 or consent of instructor. Fee: $25.

April 7,9 4pm-6pm [Mills]
Lab: April 12 9am-11am

I91. Introduction to the Time Series Processor (TSP) Package

This course is designed to present the basics of TSP usage in a lecture-lab format. Topics will include the TSP command language structure, data preparation and file usage in TSP, using TSP data banks for storage and retrieval of variables, interpretation of TSP output, and how to use the matrix capability of TSP to program your own estimators. Examples will be used extensively to illustrate the programming capability of TSP. The course assumes familiarity with IBM-CMS as well as some basic statistics and econometrics. Recommended Reference: *TSP User's Guide, Version 4.0.* Prerequisite: I23 or equivalent knowledge of CMS. Fee: $20.

April 1,2,3 7pm-9pm [Edwards-Iwe]

Statistical Package Graphics

I98. Introduction to CMS SAS/GRAPH

An introduction to using SAS/GRAPH on the IBM CMS timesharing system and CMS/SAS. Topics include: how to use SAS/GRAPH with various graphics devices, how to produce hard-copy Zeta plots from SAS/GRAPH output, global features of SAS/GRAPH, using map data

sets, calculating dimensions and proportions for Zeta plots, and highlights of new features in SAS/GRAPH. Prerequisites: I23 and I83 or equivalent knowledge of CMS, XEDIT, and SAS. Fee: $15.

March 31, April 2 7pm-9pm [Dingler]

I99. The SAS/GRAPH Annotate Facility

An introduction to using the newly developed SAS/GRAPH Annotate facility on the IBM CMS timesharing system. The Annotate facility is used to enhance graphics output. Two functions allow moving and drawing; others are used to position labels. With these functions one can overlay text on complex graphs, maps and plots. Annotate variables, functions and coordinate systems will be introduced. Several examples will be presented and explained. Prerequisites: I23, I83 and I98 or equivalent knowledge of CMS, XEDIT, SAS, and SAS/GRAPH. Fee: $15.

April 28,30 7pm-9pm [Dingler]

U series: The UNIX System

U11. Introduction to the UNIX System

This course introduces the new user to the UNIX timesharing system. It covers terminal setup, logging in and out, file commands, and useful utility programs. It also discusses how to set up a file directory, how to communicate with others through the "mesg" and "mail" facilities, and how to use the on-line help programs. Prerequisite: G10. Enrollment limited to 15. Fee: $10. Two sections will be offered.

2. April 7,9 7pm-9pm [Edwards-Iwe]

U31. UNIX Text Processing

This course covers the "command mode" and "insert mode" for both the line-oriented "ex" editor and the screen-oriented "vi" editor. In ex, command structure and addressing along with the most useful editing commands are presented. The basics of vi are discussed along with learning how to physically move through files and around the terminal screen. Use of the nroff and troff text formatters and typesetter is then considered. Prerequisite: U11 or equivalent. Enrollment limited to 15. Fee: $15.

2. April 14,16 7pm-9pm [Scheid]

U41. Intermediate UNIX

An explanation of shell concepts is given: pipelines, filters, tees, background processing, subshells, and redirecting input-output. Features specific to the C and Bourne shells are covered. The UNIX "make" utility will also be discussed. Prerequisite: U11 or equivalent. Enrollment limited to 15. Fee: $15.

1. April 1,3 7pm-9pm [Pommert]

2. April 21,23 7pm-9pm [Pommert]

Statistical Computing

U73. The S Package for Data Analysis and Graphics

S is an interactive statistical environment available on UNIX machines. It comprises a high-level language for specifying computations and a support system for data management and graphics. This introductory course provides an overview of S commands and an exposure to the S environment. The flexibility and graphical capabilities of S will be stressed. The course is divided into lecture/discussion and hands-on sessions using S. Recommended references: R.A. Becker and J.M. Chambers, *S: An Interactive Environment for Data Analysis and Graphics*; J.M. Chambers and others, *Graphical Methods for Data Analysis*. Prerequisite: U19 or equivalent and a good grasp of basic statistical analysis. Enrollment limited to 15. Fee: $25.

April 15,17,22,24 7pm-9pm [Richardson]

MANUALS

Access to the following manuals is strongly recommended for certain short courses. These documents may be purchased individually at the Illini Union Bookstore (Reference Section), 715 South Wright Street, or may be purchased as a set at the CSO Distribution Office, 1208 W. Springfield.

1. Introduction to the Cyber Systems, $2.00
2. A Tutorial Guide to the ICE Text Editor, $1.25
3. ICE Reference Manual, $3.25
4. RNF Documentation: Tutorial, Macros and Reference, $4.00 (NOTE: This manual is not included in the package; it must be purchased separately.)
5. An Index to Software on the Cyber, $3.25
6. Cyber Fortran Debugging, $1.25

NOTE: Manuals for NOS 2 are available free at the CSO Distribution Office.

TRAINING CASSETTES

CSO makes available to the user community nineteen videotape training cassettes: three introducing the Cyber system, six on the fundamentals of using SAS (Statistical Analysis System), and ten on SAS color graphics (SAS/GRAPH). The tapes may be obtained at the Media Desk in the Undergraduate Library (upper level, in back). Show your University ID to the clerk on duty there and state the title of the videotape you wish to use. If a machine is available, you will be taken to a room containing the videotape equipment and shown how to operate it. If all machines are in use you can make a reservation for a later time.

CSO Videotapes

CSO has produced a series of three videotapes (comprising eight segments) which introduce the novice to computing on the Cyber system. A viewing guide containing the major displays in this series is available and can be used to facilitate note taking. Ask for your free copy of the viewing guide when you check out any of these videotapes for viewing.

The title and a brief synopsis of each segment is given below. Running time is 10 to 15 minutes for each segment.

1. **CSOVT1.**
   1.1 Introduction to Computing at CSO: A brief look at the steps required to solve a problem using a computer, and at some of the hardware used.

2. **CSOVT2.**
   2.1 Using a Terminal: A description of the physical operation of a terminal and some of the keys that have a special meaning to the Cyber.

   2.2 Introduction to Cyber Timesharing: A tutorial on logging on and off the Cyber.

   2.3 File Usage: Local files and indirect access to permanent files. An introduction to Cyber files and the commands used to manipulate them.

   2.4 Introduction to ICE Text Editing: A tutorial on entering and modifying files with ICE.

3. **CSOVT3.**
   3.1 Running a Fortran Program: Concepts. A discussion of the concepts of compilation, loading and execution.

   3.2 Running a Fortran Program: The PROGRAM statement. A discussion of the PROGRAM statement and its relationship to files accessed by the program.

   3.3 Running a Fortran Program: Control Statement. A discussion of the control statements used to compile, load, and execute a Fortran program.

A copy (Beta-1 format) of these videotapes is available for loan from CSO to any instructor wishing to use them in class. They have been effectively used in this environment several times recently, with the instructor stopping the playback equipment whenever he/she wished to elaborate further or questions arose from the class. To borrow a videotape for classroom use and obtain copies of the viewing guide for class distribution, call the CSO training coordinator: Ron Szoke, 333-8630. If you do not already have access to the required videotape equipment, Betamax viewing equipment can be borrowed from the Office of Instructional Resources, 333-3690.

SAS Videotapes

CSO has leased the SAS Basics 100-Series video training course. The course combines video and workbook media to deliver performance-based SAS training. The information in the course is contained in six videotapes.

The videotaped instruction is not complete without the workbook, which contains exercises and illustrations to reinforce the material presented in the videotapes. A copy of the workbook is available for reference at the Media Desk. You may, however, wish to obtain a personal copy of the workbook to complete the exercises, to take notes, and to use as a reference after the course is completed. The workbook may be purchased for $8.00 at the CSO Distribution Center, 1208 West Springfield, Urbana.

NOTE: The SAS videotapes are not available for loan.

The title of each of the videotapes is given below. Running time is about 45 to 60 minutes for each tape.

B101. Introduction to SAS.

B102. Getting Your Data Into a SAS Data Set.

B103. Program Processing.

B104. Working with SAS Data Sets.

B105. Report Writing.

B106. SAS procedures.

A Cyber terminal user may obtain more information about each via:

```
TYPE,SASVID/AS/UN=COURSES.
```

The Media Desk also has the ten tapes in the SAS color graphics (SAS/GRAPH) series and a reference copy of the student workbook. For more details:

```
TYPE,SASGRAF/AS/UN=COURSES.
```

Audio Cassettes

CSO makes available to the user community three sets of audio cassette tapes for the training of microcomputer users:

1. How to Operate the IBM Personal Computer (on 3 cassettes)
2. How to use MultiMate (3 cassettes)
3. How to use Lotus 1-2-3 (4 cassettes)

These cassettes, with accompanying printed materials, may be borrowed for up to one week by contacting Ron Szoke, 333-8630.

CYBER SYSTEMS

HINTS FOR USING VMBATCH FROM THE CYBER 175

Joan Alster and Becky Wetzel

Since OS/MVT is no longer available for Cyber 175 users who wish to run IBM jobs, many people are now using VMBATCH for processing jobs under CMS on the IBM 3081 (VMD) computer. Several recent *Off-Line* articles have discussed methods for submitting jobs to VMBATCH from the Cyber 175. As we gain experience with the process, we have accumulated additional information which should prove helpful to Cyber users of the VMBATCH Subsystem.

The most frequent complaint among Cyber users of VMBATCH is that after they submit jobs for VMBATCH processing, they never receive any output. The following suggestions are provided to help insure that you receive your output.

*Correct *BATRJE. Header Line*

The *BATRJE. header line must be typed exactly correctly or you will receive no output from your VMBATCH job. A correct *BATRJE. header line begins:

```
*BATRJE.uuuuuuuujjjjjj
```

where:

*BATRJE.	must appear in columns 1-8.
uuuuuuuu	is any 1-8 character "user ID" contained within columns 9-16.
jjjjjj	is a 1-6 character "job ID" which MUST be left-justified in columns 17-22. IMPORTANT: See also "Choice of Job ID" below.

Other optional parameters may appear on the *BATRJE. header line. Most notably, a job class may be specified in column 33. The default job class for jobs submitted from the Cyber 175 is class A, which permits the job to use minimal resources (20 seconds CPU time, 1600K bytes of memory, no tapes). For information about VMBATCH job classes, see the September, 1985 *Off-Line* or the soon-to-appear Reference Guide RF-20.5, "VMBATCH Class Specification."

Choice of Job ID:

When a job is submitted to VMBATCH from the Cyber, VMBATCH assigns the job to a file whose name is comprised of (1) the Cyber UN from which the job was submitted, and (2) the job ID (columns 17-22) from the *BATRJE. header line. At any given time, all VMBATCH jobs executing or awaiting execution must have unique VMBATCH-assigned file names. Therefore, if you have several jobs to be processed concurrently by VMBATCH, you should assign different job ID's to each job. If you submit concurrent jobs with the same job ID, only the first job will be processed. All others will be lost and no output returned.

Additional VMBATCH Job Statements to Insure Return of Console Output Even if the Job Contains Errors

If errors occur in the VMBATCH job, the "console" file may contain information which can help you debug your job. The sequences of VMBATCH commands suggested in earlier issues of *Off-Line* and CSO handouts only work well if errors do not occur which prevent execution of the commands which control return of the console output. We have seen, however, that many errors cause immediate job termination, preventing return of the console output to the user. Therefore, we suggest you immediately incorporate into your VMBATCH jobs the sequence of commands illustrated in the following examples. In the examples, the consoles are spooled (i.e., routed) to ROUTER, a system program which receives files and sends them to their proper destinations. Whether the jobs fail or succeed, ROUTER receives the console outputs and sends them to the appropriate Cyber fetch queues.

As a point of interest, the examples make use of the COST exec, which returns information about the cost of running the job.

Example Program Containing FORTRAN Error:

```
*BATRJE MYSELF  MYJOB
&TRACE
CP SPOOL CONSOLE STOP PURGE
CP SPOOL CONSOLE ROUTER START CL A
&TYPE &BLANK
&TYPE TO: 3UVWXYZ@UIUCNOSA
&TYPE X-BANNER: MYFETCH
&TYPE &BLANK
&TRACE ALL
VMDATA &FILENAME
EXEC FORTVS MISSING
TYPE MISSING LISTING
LOAD MISSING (START
EXEC COST
&EXIT
.DATA MISSING FORTRAN
      PRINT *,' THIS CALLS A MISSING SUBROUTINE'
      CALL NOSUB
      PRINT *,' THE MISSING SUBROUTINE WAS CALLED'
      STOP
      END
 END
```

The seven statements which accomplish the routing to ROUTER begin with &TRACE and continue through the statement preceding &TRACE ALL. The first of the CP SPOOL CONSOLE commands clears out anything which might be in the console file. The second CP SPOOL CONSOLE command actually spools (routes) the console to ROUTER. The next four &TYPE commands put headings at the beginning of the console file. ROUTER will use the headings to determine where to send the console file when the VMBATCH job ends. The TO: field contains the Cyber user number to which the console output should return. (The example shows Cyber user number 3UVWXYZ. To determine your user number, type WHO,ME while logged on to the Cyber.) @UIUCNOSA is the routing name for the Cyber 175 and must appear as shown. The X-BANNER: line is optional; it provides a name (1 to 7 characters) under which the console output will be known in the Cyber fetch queue (default name for the console output is OUTPUTX). NOTE: You do not use the CP SPOOL CONSOLE * START, CP CLOSE CONSOLE, READ CONSOLE FILE, and EXEC NPRINT CONSOLE FILE statements shown in earlier *Off-Line* articles and handouts. The seven routing statements of this example are all you use.

To run the above job under VMBATCH, create a Cyber file containing the statements shown, substituting your choice of user ID and job ID in columns 9-16 and 17-22, respectively, of the *BATRJE. line. Also substitute your Cyber user number (your UN) on the &TYPE TO: line and a fetch queue file name for the console file on the &TYPE X-BANNER: line.

To submit the job to VMBATCH, type:

```
SENDJOB,batfile/DEST=VMBATCH
```

where batfile is the name of your Cyber file containing the above example.

The next example illustrates the use of the sequence of statements with a SAS job. In addition to demonstrating routing the console to ROUTER, the job illustrates use of the COPY command to append the LISTING file to the SASLOG file so only one SAS output file is returned to the Cyber fetch queue. As with the previous example, you will need to change columns 9-22 of the *BATRJE. header line, and the TO: and X-BANNER: lines to meet your own requirements. Also, the DEST specified on the EXEC NPRINT command must be changed to your Cyber UN to direct the SAS output to your fetch queue.

Example SAS Program:

```
*BATRJE.MYSELF  MYJOB            B
&TRACE
CP SPOOL CONSOLE STOP PURGE
CP SPOOL CONSOLE ROUTER START CL A
&TYPE &BLANK
&TYPE TO: 3UVWXYZ@UIUCNOSA
&TYPE X-BANNER: MYFETCH
&TYPE &BLANK
&TRACE ALL
VMDATA &FILENAME
EXEC LINKTO SAS
EXEC SAS PROG1
COPY PROG1 LISTING A PROG1 SASLOG A (APP
EXEC NPRINT PROG1 SASLOG A (DEST 3UVWXYZ NODE UIUCNOSA
EXEC COST
&EXIT
.DATA PROG1 SAS A
DATA ONE;
INPUT A B C;
CARDS;
2 3 43
3 4 52
4 5 68
6 7 83
3 4 55
PROC PRINT;
.END
```

The last example shows an SPSSX job which is analogous to the SAS job in all respects except that the COPY command is not needed because SPSSX puts all output into a single file. As with the SAS example, you must modify the *BATRJE. header line, the TO: and X-BANNER: lines and the DEST option of the NPRINT command before running the job yourself.

Example SPSSX Program:

```
'BATRJE.MYSELF  MYJOB            B
&TRACE
CP SPOOL CONSOLE STOP PURGE
CP SPOOL CONSOLE ROUTER START CL A
&TYPE &BLANK
&TYPE TO. 3UVWXYZ@UIUCNOSA
&TYPE X-BANNER  MYFETCH
&TYPE &BLANK
&TRACE ALL
VMDATA &FILENAME
EXEC LINKTO SPSSX
EXEC SPSSX PROG1
EXEC NPRINT PROG1 LISTING A (DEST 3UVWXYZ NODE UIUCNOSA
EXEC COST
&EXIT
 DATA PROG1 SPSSX A
DATA LIST LIST / A B C
LIST
BEGIN DATA
2 3 43
3 4 52
4 5 68
6 7 83
3 4 55
END DATA
.END
```

IBM SERVICES

EISPACK AND LINPACK ON VMD

Bruce C. Richardson

The EISPACK and LINPACK libraries of linear algebra Fortran subroutines have been installed on VMD. Both the single and double precision versions of the real and complex LINPACK routines are available. However, only the double precision EISPACK routines are available.

To access these packages use the command :

```
LINKTO packname
```

where packname is either LINPACK or EISPACK. This command will link you to the requested library and add it to the global library set. Also available for each library is a document file, named "packname DOCUMENT", which contains a list of the routines in the package.

CMS SHARED SOFTWARE

Bruce C. Richardson

The CMS Shared facility of user supplied and supported software now contains the products listed below. To access any or all of these products issue the command

```
LINKTO prodname (SHARED
```

where prodname identifies the product or is ALL for the entire set of products. After you have linked to the products, on-line help can be obtained by typing:

```
HELP SHARED prodname
```

Products available in SHARED are:

ACED	Algorithms for the construction of experimental designs.
BILOG	Item analysis using binary logit methodology.
BULBOARD	A bulletin board for user comments and ideas.
RATS	Regression analysis for time series data.
TBROWSE	A tape browsing facility.

MICROCOMPUTER SERVICES

PC CONSULTING

Jack Knott

CSO is pleased to have a group of talented students who are performing duties as PC Consultants. The PC Consulting Office is located in Room 91 Commerce West. Hours are 10:00 am — 5:00 pm, and the telephone number is 244-0608. The consultants are knowledgeable in many software packages and are quite willing to help.

We are always interested in receiving your ideas and suggestions about ways in which we can make the service be of the most benefit to you. Should you have a suggestion, comment, or complaint, please put them in writing and send to Jack Knott, 150 DCL.

CSO is always interested in receiving an application from any student interested in serving as a PC Consultant. Please send a resume to Jack Knott, 150 DCL, or call 333-6562 and leave a message.

COMMUNICATION SOFTWARE — AZPC2

The PC Consultants

The CSO PC Consultants have been working on communication software for connection between a PC and any mainframe. A problem that has frustrated most users has been trying to upload and download data to and from the VMD system. As most people have discovered, using AZPC2 does not allow uploading data to the VMD system. In the past we have recommended transferring files to the Cyber and then from the Cyber to VMD.

Now it is possible to use KERMIT to transfer data to and from VMD. Mike Krogh, resident expert on the VMD system, has written the msKermit.ini file, necessary to perform the transfer. If you would like an updated copy of the file, please come in with your disk and we will give you one.

Even though KERMIT is now available, the consultants are still working on the problem of file transfer using AZPC2. If anyone has any further information about AZPC2 or file transfer to VMD, please contact Mike Krogh; you help or suggestions would be greatly appreciated.

In addition, we have expanded our hours to help the lunch time crowd. The new hours will be 10:00 am to 5:00 pm, Monday — Friday. We also have an answering machine to handle calls when the office is closed. Please leave your name, number, and a brief description of the problem and someone will return your call as soon as possible after the office opens.

If you have any suggestions on how we can serve you better, please feel free to come in or call. The office is in 91 Commerce West and the telephone number is 244-0608.

USER GROUPS

ANNOUNCING THE FORMATION OF THE UIUC CMS USERS GROUP

Greg Kesner

On Thursday, April 3, 1986, there will be an organizational meeting of the UIUC Users Group. If you currently use the IBM VM/CMS system or expect to utilize it in the future, you are invited and encouraged to attend. Please also invite your associates who use CMS to attend. Our meeting will be held in room 223 Gregory Hall from noon to 1:00 pm.

We expect this users group to be an effective forum for the exchange of knowledge, experience, expertise, and software tools to help all of us more effectively work with the CMS system. As CMS usage has increased on the campus for both research and teaching, the benefits of such a forum have grown increasingly evident.

If you have questions regarding this users group, please contact Greg Kesner (CMS userid: KESNER AT UIUCVMD) for more information. We hope to see you at the meeting!

HELP WANTED & SALES

COMPUTER PROGRAMMERS WANTED

The Office of Agricultural Entomology and Departments of Entomology, Physiology and Biophysics, and Plant Biology have openings for both part-time and full-time programmers. The starting date may be immediate or during the summer, and the appointment may be on an hourly or assistantship basis. The positions are in support of an EXCEL project to develop microcomputer simulations of dynamic biological systems. Duties will vary depending upon the abilities and interests of the successful applicants, but may include:

1. Conversion of Fortran programs currently running on mainframes to the PC-DOS environment.
2. Development of user interfaces to simulation programs.
3. Graphical routines using GKS, PC Plotting System, and various other graphics and animation packages.
4. Applications to use the IBM Token Ring Network.
5. Communications among mainframe, micro-, and minicomputers.
6. Development of novel application programs for the classroom.
7. Writing user manuals.

At least some of the positions will continue into the following year. Pay will be commensurate with skill and experience. For further information please send a resume and/or letter explaining qualifications to:

Milton E. McGiffen
Office of Agricultural Entomology
172 Natural Resources Building
607 E. Peabody Drive
Champaign, IL 61820

COMPUTER SCIENTIST

Research Organization seeking self-motivated individual with Bachelor's or Master's degree (or equivalent experience) in computer science or related field to be responsible for updating and enhancing an information delivery system for businesses, government agencies, and general public. Knowledge of scientific programming, and Fortran 77 or Pascal is required. Experience with PRIMOS and IBM PC/DOS preferred. By April 1, send letter of application, resume, samples of program code, with names, addresses, and phone numbers of three references to:

Edward Armbrust
Illinois Natural History Survey
607 E. Peabody Drive
Champaign, IL 61820

SURPLUS EQUIPMENT

Image Systems 201 microfiche reader. Automatically retrieves and displays COSATI-format (5 x 12 image) microfiche cards. Appears to be working; minimal documentation available. **FREE** to any University/non-profit user. Contact John Nuetzel, 333-2230.

EQUIPMENT FOR SALE

FOR SALE: VECTRIX CAD SET DISPLAY CONTROLLER for IBM PC. 512 simultaneously displayable colors from a color palette of 4096. 672 x 480 resolution. The two board set comes with full documentation and "PAINTPAD" paint software. Full hardware emulation of IBM Color Graphics Card. Light pen support. Price: $1,795.00 (listed value $3,095.00). If interested, contact:

Jim Kaufman
Art and Design's Electronic Imaging Lab
126 Art and Design
telephone: 333-1796

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Off-Line

University of Illinois at Urbana-Champaign VOL. 14, NO. 4 April 1986

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PHONE: (217) 333-6236
120 Digital Computer Lab
1304 W. Springfield Ave.
Urbana, Illinois 61801

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Systems Consulting	**1208**	**W Springfield**	**333-6133**
Statistical Services Consulting	**85**	**Comm West**	**333-2170**
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	Switch	**1200**	**baud**	**333-4008**
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Consulting	Stan Kerr	208	CSOB*	333-4715
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Site Operations	Sylvia Hansen	65	ME	333-6285

*CSOB is the new CSO Office Building, 101 S. Gregory, Urbana.

CSO Sites (see Reference Guide RF-0.3 for operating hours)

Agriculture	N-120	Turner Hall	333-8170
Chemistry	153	Noyes Lab	333-1728
Commerce West	70	Comm West	333-4500
CRH Snack Bar	120	Snack Bar	333-1851
DCL Routing Room	14	DCL	333-6203
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OFF-LINE is the monthly newsletter of the Computing Services Office at the University of Illinois at Urbana-Champaign. Unless otherwise indicated, permission to reprint is freely granted, provided that the author, if named, and the Computing Services Office (CSO) are credited. Information in this issue is current as of April 14, 1986.

Academic and research computing is done on the following machines: CDC Cyber 175 running NOS 1; CDC Cyber 174 running NOS 2; IBM 3081 running VM; IBM 4341 running VM; VAX 11/780 running UNIX and driving a GSI CAT-8 phototypesetter; three Pyramids a dn a Sequent running UNIX. In addition CSO serves as Facility Manager for various departmental machines (e.g., other IBMs) and for the National Center for Supercomputing Application's CRAY X/MP.

Operating Hours (see HEARYE,SCHEDUL for exceptions):

	CYBERS 174/175	IBM
M-F	8 am - 6 am	8 am - 6 am
SAT	8 am - Midnight	8 am - 6 am
SUN	Noon - 6 am	Noon - 6 am

POLICY

FROM THE DIRECTOR

George Badger

The past year has been the most difficult in CSO's history An enormous amount has been accomplished, but at a high price to everyone — user and staff alike. We are now actively involved in getting more faculty participating with the staff in planning for the future, and getting more order back in our lives. This article recaps some of the major events of the year, points out problems we have identified, and gives some initial ideas about the future.

Highlights of the past year include:

- Addition of UNIX systems serving approximately 100 concurrent users — both students and researchers.
- Addition of a new IBM 3081, roughly equal in capacity to the two Cybers; extension of consulting services related to the CMS operating system.
- Support of more than 500 personal computers through phase II of project EXCEL.
- Initiation of an IBM PC maintenance service.
- Addition of over 400 new network connections via SYTEK.
- Resolution of the construction requirements for campus data networks in conjunction with the new phone switch.
- Establishment of a prototype network using token-ring technology.
- Initiation of support for the Apple MacIntosh, including the conversion of some CS101 classes (engineering students) to a MAC for all programming assignments.
- Activation of a faculty committee to help CSO evaluate the future directions of our programs.
- Installation of an IBM 3800 printer — for high-speed, high-resolution output.
- Installation of the first portion of a campus-wide mail service among our Cybers, our IBM machines, and some of our UNIX machines and VMS machines.

The above list covers accomplishments aimed solely at our traditional clientele. In addition, CSO has facilities management responsibility at both the Center for Supercomputer Research and Development (CSRD) and the National Center for Supercomputer Applications (NCSA). At CSRD we have installed and are operating an IBM 4381 and a VAX 11/785.

The NSF-funded supercomputer facility, NCSA, is the largest change of the past year. Some of CSO's roles included:

- Hiring approximately 30 new staff in areas such as operating systems, networking, graphics, central file system.

- Installing the CRAY computer, including major remodeling of the Astronomy Building site.
- Installing two VAX 11/785 computers.
- Serving as national coordinator of a network interconnecting all of the supercomputer centers and NCAR (National Center for Atmospheric Research).
- Starting a prototype satellite network connecting NCAR and five other schools.
- Constructing a 25 person office building to accommodate the increase in overall staff.
- Bringing in the next generation of equipment and software for a network file service expected to grow in excess of one trillion bits by the end of this year. This is a joint campus/NCSA service and is already in service for the CRAY, with VMS service expected to follow soon.
- Providing new graphics and hardcopy output support.
- Providing general support to NCSA until they were able to build a basic staff structure.

To show the magnitude of the NCSA impact on CSO, we need only point out that it approximately doubled the CSO managerial/professional staff in less than six months, forced rapid acceleration of networking and network server projects, and changed us from having staff and computers housed primarily in a single building (DCL) to being spread out with staff in five buildings and major computing equipment in two of those plus two others. This has strained our capability to keep close communication within the staff and made communication with the users very difficult.

CSO faces — and is beginning to attack — several major challenges:

- Expectations of faculty and students have changed dramatically, particularly with respect to microcomputers and networking. Most support of these areas has come from internal reallocation (people and equipment funds) rather than new sources, but there also continues to be increased demand for traditional services.
- Almost all of the staff's experience is with large systems with a heavy emphasis on CPU services. The future of centers like CSO depends on reacting effectively to needs in networking, network servers, and a heterogeneous mix of requirements. Our recent equipment acquisitions have targeted smaller machines to specific software requirements, frequently associated with specific groups of users. The pressure on the consulting staff to cope with the resulting diversity has been enormous. We will be training and/or hiring more staff in small system support.
- The number of different organizations involved in computing, particularly microcomputing and communications, and the number of users who want to deal on both sides of the academic/administrative boundary, introduce a large amount of confusion. This does seem to help keep some critical things moving more rapidly.
- With all the pressures to do more and act faster, we are seeing significant erosion of our income from grants and contracts. This is happening despite increased use by recipients of grants and contracts, and increased computer funds in them. A reevaluation of the allocation policy of the Research Board and of the SARA process needs to be undertaken.
- The equipment used for mass file storage on the Cyber has very serious problems — there is no longer a reliable spare parts or maintenance source for this equipment. We do have a solution to the file problem staring this summer. We also have to evaluate the Cyber service in general. It still meets some needs very well, but it is functionally obsolete; therefore, we will be making

key decisions about the future of the Cybers. (At least a year's notice will be provided before this service is discontinued; service options for affected users will be known at that time.)

- Currently the campus provides CSO less than $50 per student per year for computing. Faculty and student expectations are for services that will cost 5 to 10 times that much. The campus and CSO have been very aggressive in pursuing gifts/grants and discounts. All potential sources are being looked at, including student fees, increased state appropriations, residence hall room rent increases, and student-purchased machines. Significant funds will be necessary even given the expected continuation of corporate discounts and gifts.

- There are signs of renewed interest by state government in exercising more influence or control over computing activities.

- CSO offices and equipment are located in several buildings across campus. The staff are frequently unable to be reached because of having to work with people at other locations. Methods for dealing with this will include a major revision of how we handle telephone calls, using some call forwarding to secretarial support and electronic mail. Already 22 people who have critical service roles are on pagers 24 hours a day. We also need to see that demands on people's time allow them to respond to calls.

In summary, we feel that the effects of the explosive growth caused by the NCSA and EXCEL projects made the last year more turbulent than usual. On the other hand, there are sufficient other opportunities and problems to assure us that no period of calm is on the horizon. We take great pride in the fact that CSO helps make this campus a very effective competitor for activities like NCSA and EXCEL.

The Computing Services Office has traditionally had a committee of faculty to serve in a review and advisory capacity for the director. This committee deals with most short-term decision making regarding operating policies, minor acquisitions of equipment, and areas such as policy regarding charging for services. In addition to this, the committee is instrumental in selecting the long-term objectives and strategies for the center. Members of the committee for the current academic year are: Larry Jones (Psychology), Bob Wilhelmson (NCSA/Atmospheric Science), Tim Trick (Electrical Engineering), Bill Kubitz (Computer Science), Judy Liebman (Mechanical Engineering), Henry Wilkinson (Plant Pathology), Ann Huff (Commerce), Jim Kaufman (Fine Arts), Dan Grayson (Mathematics), Tom Phillips (Life Science), Leigh Estabrook (Library School), Dick Dennis (Education). While the members of this committee will influence the future of computing on this campus, it is also important that you participate in the planning. We would appreciate hearing from you about how best to meet your future requirements.

CHANGES IN SYSTEMS & STATISTICAL CONSULTING OFFICE HOURS

Effective April 21, the Systems Consulting Office (1208 W. Springfield Ave.) is not closed during the noon hour on Wednesdays but instead is closed from 11:45 am - 1:00 pm on Fridays. Also, new expanded Friday hours for the Statistical Consulting Office (room 85 Commerce West) are 9:00 am - 11:45 am and 1:15 - 5:00 pm.

Summary of New Consulting Office Hours:

Systems Consulting Office:

Monday through Thursday:	9:00 am - 5:00 pm
Friday:	9:00 am - 11:45 am, 1:00 pm - 5:00 pm

Statistical Consulting Office:

Mondays and Wednesdays:	9:00 am - 1:00 pm
Tuesdays and Thursdays:	9:00 am - 5:00 pm
Fridays:	9:00 am - 11:45 am, 1:15 pm - 5:00 pm

MICROCOMPUTER SERVICES

A VIEW OF LOTUS 1-2-3 NEW FEATURES IN RELEASE 2

Steve Smith: PC Consultant

The new Lotus 1-2-3: Release 2 includes many new features. Some of these make Lotus 1-2-3 easier or more convenient to use; others add new functions. While Lotus 1-2-3 has expanded, nothing has been taken away. You can continue to use Lotus 1-2-3 as you have in the past. All the features in earlier releases are still there.

The worksheet includes 256 columns (as before) and 8192 rows (as compared to 2048 in earlier releases). To let you take advantage of the larger worksheet, Release 2 uses computer memory more efficiently. You can place entries in remote areas of the worksheet without taking up extra memory. If you have extended memory, Lotus 1-2-3 can use up to approximately four megabytes of memory. This lets you create much larger worksheets than before. If your system has an 8087 or 80287 math coprocessor, Lotus 1-2-3 uses it for floating point arithmetic. This speeds up your calculations.

Any time you designate a file in a Lotus 1-2-3 command, you can specify the complete pathname. You do not need to change the file directory first. You can move back and forth between a worksheet and your operating system without leaving Lotus 1-2-3. The control panel displays information about column width and protection. The /Worksheet Status command now displays a complete screen of information related to your current status. You can work with labels (text entries) in a variety of new ways. You can put a formula in E2, for example, that joins separate cell entries from a database to start a form letter.

With a new category of @functions, called string functions, you can convert words to uppercase or lowercase, extract pieces of text entries, and much more. Release 2 lets you do the same with hours, minutes, and seconds. You can also suppress the display of selected columns. You use the /Worksheet Column Hide command to accomplish this.

If it comes down to the question of whether to upgrade or not, even if you don't require any of the above improvements at the present time, I would recommend upgrading your version. You never know when you might need the enhancements. If you have any questions about Lotus 1-2-3: Release 2, feel free to give the CSO PC Consulting Office a call at 244-0608, or stop by and see us in Room 91 Commerce West between the hours of 10:00 am and 5:00 pm, Monday - Friday.

SURVEY OF INTEREST IN IBM-PC OR PC-COMPATIBLE VERSIONS OF BMDP (BMDPC) AND SPSS (SPSS/PC+)

Anup Roy

In addition to licensing the soon-to-be-released SAS/PC software for IBM PC/XT and IBM PC/AT (and XT- or AT-compatibles) under PC DOS, the Statistical Group at CSO would like to support the microcomputer versions of two other large-scale statistical software packages, BMDPC and SPSS/PC+, if and when they become available on a site-license basis. Thus, we are conducting a survey to gauge the level of interest in these two packages.

Please complete the survey form near the end of this issue of *Off-Line* and send it to us as soon as possible, so that we can act on an informed basis in this matter.

Below are some brief descriptions of BMDPC and SPSS/PC+ so that you may get a feel for what the two packages have to offer vis-a-vis what your needs might be.

The prices for these products are set on a volume-discounted sliding scale, and the price for any individual user will depend on the number of users who wish to use the particular package.

NOTE: CSO will be offering a short course called **Micro Versions of Mainframe Statistical Packages** (M75) on April 29 and May 1 from 7 to 9 pm. We strongly recommend that you attend this class if you are interested in these products for the PC. The course has a fee of $15.00; you may register for it by filling out a registration form at 162 DCL during normal office hours, or you may request that a form be sent to you by calling 244-1257.)

BMDPC (BMDP/PC)

BMDPC is a comprehensive statistical analysis package marketed by BMDP Statistical Software, Inc. (Los Angeles, California) for the IBM-PC and/or compatible microcomputers. It is a large collection of separate data analysis programs (modules) that can be used independently of one another. Twenty-nine of the 40 mainframe BMDP programs are available now; the remaining 11 are scheduled for release by August. The various programs share a common data entry method and control language, and the data created by one program can be used by another program.

Designed with the professional statistician in mind, BMDPC covers a broad range of statistical techniques, including several that are rarely found in other statistical packages. Some examples of the programs available are: basic descriptive statistics, plots and histograms, t-tests, one-way analysis of variance, missing data interpolation, regression, analysis of variance and covariance (including repeated measures), non-linear and logistic regression, log-linear modeling for multi-way contingency tables, multivariate analyses (factor, canonical correlation, discriminant, cluster, etc.), non-parametric statistics, time-series analysis (both frequency domain [spectral and cross-spectral] and time domain [Box-Jenkins]), survival analysis, etc.

BMDPC requires an IBM XT or AT (or compatible) with at least a 5 megabyte hard disk (however, a 20 megabyte hard disk is strongly recommended), a floppy disk drive that can read double-sided, double-density diskettes, an 8087/80287 floating point math coprocessor, 640KB RAM of memory, and PC-DOS 2.0 (or MS-DOS) or a later version.

BMDPC programs can be executed in either batch or interactive mode. The programs appear to be thorough, reliable, flexible and convenient; up to 16,000 cases can be entered and analyzed.

BMDP, Inc., has announced the imminent release of a feature called DATAMAN, which will provide a full-screen editor/data display manager, and will also allow the user to match-merge/concatenate datasets and work with hierarchical files. Data from popular spreadsheet systems like Lotus 1-2-3 and database management system packages like dBASE III can be readily loaded into the system as well, with very little difficulty.

BMDP, Inc., has also released EQS/PC (EQuation Solver), a structural equations modeling program developed by Dr. Peter M. Bentler at UCLA. EQS, deemed a strong competitor to the LISREL program, can perform a wide range of statistical analyses such as path analysis, simultaneous equations modeling, multivariate regression, confirmatory factor analysis, latent structure analysis, etc. — yet it requires no knowledge of matrix algebra to specify a model. Also the assumption of multivariate normality that is so critical to the use of LISREL is not needed. In addition to classical least squares, EQS provides generalized least squares, maximum likelihood, distribution-free and elliptical theory techniques of parameter estimation.

SPSS/PC+

The SPSS/PC+ statistical software package from SPSS, Inc. (Chicago, Illinois) is a group of products designed to organize, analyze and display data in a relatively simple and convenient way. The package is composed of:

- SPSS/PC+ — The base system containing all data and file-handling routines; basic descriptive statistics; t-test; one-way analysis of variance (multiple comparison tests); correlation and regression procedures; non-parametric statistics; and report writing and preliminary plotting functions.

- SPSS/PC+ Advanced Statistics — Advanced statistical procedures such as: factor, cluster, discriminant, and hierarchical log-linear analyses; multivariate analysis of variance and covariance (including repeated measures designs).

- SPSS/PC+ Tables — A supplement to the data display and analysis capabilities, it provides the means to display results of analyses or to summarize data in any tabular form. The output is publication quality and can be directed to a wide variety of printers, including laser printers.

- SPSS/PC+ Graphics featuring Microsoft Chart — With two main components, Microsoft Chart and SPSS's Graph procedure, SPSS/PC+ provides the ability to summarize and display data using presentation-quality graphics. (It is our understanding that the Graph procedure can also be implemented with Chartmaster, from Decision Resources, Inc., and GrafTalk from the Redding Group.) One can create charts quickly and easily, insert text wherever one wants, customize charts right on the screen, and produce top quality output that is compatible with a variety of plotters, laser printers and dot-matrix printers, as well as with several high-resolution video-display devices and film recorders.

SPSS/PC+ runs on an IBM PC/XT or PC/AT (or many of the IBM-compatible microcomputers) with at least 384K available RAM (some procedures like Tables and MANOVA require at least 448K); a 10 megabyte hard disk, although at least 20MB is recommended; a 5 1/4" double-sided, double-density floppy disk drive; an appropriate math coprocessor (8087/80287) -- optional but highly recommended; PC/DOS (or MS/DOS) 2.0 or higher; either an IBM Enhanced Graphics Adapter (EGA) or an IBM Color/Graphics Monitor Adaptor, or a Hercules Graphics card (for the graphics features).

SPSS/PC+ comes with an excellent full-screen editor/display manager called REVIEW, which can be used to build, browse and edit datasets and execute jobs in an interactive environment. One can, of course, also do batch processing. Procedures are provided for transfer of raw data or SPSS-X and

portable SAS system files (binary datasets) to and from linked mainframe computers. The communications and file transfer utility, KERMIT, is provided free with the product for this purpose.

SPSS/PC+ allows processing of datasets containing up to 200 variables. The number of cases permitted is limited only by the amount of disk space and memory on one's machine. SPSS/PC+ can also read or write ASCII files, enabling one to interface with packages such as Lotus 1-2-3, dBASE III, Multiplan, or Wordstar.

FEATURE ARTICLES

PRINTERS FOR MICROS

Dr. Nigel M. Waters
Department of Geography
The University of Calgary, Canada

(This article was reproduced with permission from the University of Calgary Academic Computing Services' newsletter, The Big Byte, February 1986. The article originally appeared in ***The Operational Geographer****, No. 8, 1985.)*

INTRODUCTION

Over 400 microcomputer printers are now commonly available on the North American market (Schwartz, 1985) and new models are being produced at an average rate of two a week (Dickinson, 1985a). This column reviews the main features of the leading types of technology used in these printers; **impact** daisywheel and dot matrix printers, and **nonimpact** electrostatic, thermal, ink jet and laser printers. A brief guide to printer selection is also presented as well as a review of associated peripherals and software. The aim is to make the geographer (user) aware of some of the newest technology available and to provide a guide in choosing the appropriate printer.

A considerable range of materials and publications was consulted for this column in addition to the author's own "hands on" experience with a variety of available printers. The three most useful resources were Schwartz (1985), Ledin (1984) and finally PC Magazine (1985, 4(19)). The last provides numerous articles on printers and "torture tests" of 70 of the newer models. This is the second largest consumer product test after that reported in their 1984, 3(32) issue which tested 120 printers. Apparently Consumer Reports only makes it into fourth place with its product test of 60 shampoos! A very useful source of information is Thompson (1985) providing a complete product directory of software, hardware and peripherals for the IBM, PC, XT, AT and compatible computers.

PRINTER TYPES

Impact Printers

Impact daisywheel printers and thimble printers. These printers work in the same way as an IBM Selectric typewriter. The characters are formed using a print element which may be either a thimble or daisywheel with the characters on the end of petals or spokes radiating out of a central hub. The result, especially when used with a carbon ribbon, is very high or letter quality output. To produce different

fonts the daisywheel or thimble must be changed in the same way as the "golf ball " on an IBM Selectric. This is a severe handicap if the printer is to be used to produce manuscripts with expensive mathematical notation.

These printers tend to be very slow and are usually rated at 12 to 40 characters per second (cps). For a printer averaging 25 to 30 cps, a twenty page, double-spaced document will take about 30 minutes to print. Since this is too slow for most users, one solution would be to purchase a printer with a print spooler or print buffer to store the information and release the host computer for other uses. Determining the size of an appropriate printer buffer is straightforward using the general rule that it will require about 2K (2,048) bytes or characters to store each double-spaced page of a document.

Producing characters using a template rather than a series of dots means that these printers are not capable of providing any real graphics beyond simple charts and bar graphs. <color can only be produced if the ribbon is changed. These printers, using an impact process, are extremely noisy; PC Magazine (1985, 4(19): 183-193) generally found them to produce around 75 decibels although the manufacturers often rated them at least 10 decibels lower.

Dickinson (1985b) recently presented 16 of the 70 printers he tested in an "honor roll" of the very best printers. Four out of the 16 are daisywheel or thimble printers. Dickinson refers to them as printers with fully formed characters. These are the NEC Spinwriter at US$545, the Panasonic KX-P3151 ar US$659, the Primages Primage 90 at US$1,492 and the Qume Sprint 11/90 Plus at US$2,500. All produced very high quality output at low noise levels (low for impact printers). The main differences among them were in speed which is very closely related to price. The Qume at 63cps is almost four times as fast as the Spinwriter at 17 cps (all speeds are the tested rates, not manufacturers' claims). The Qume has a very high speed for a letter quality printer but is the noisiest.

Impact dot matrix printers. Dot matrix printers (dmp) are probably the type of printer most commonly used with microcomputers. They create a character using tiny wire pins, referred to as hammers, which strike a ribbon thus transferring the image to the paper. The number of pins used to form a given character depends on the size of the matrix. Cheaper dmps typically have a matrix of 5 by 7 pins or, more commonly now, 7 by 9 pins. The better quality printers will have a density of 18 by 9 pins or 40 by 18 pins in their matrix. This gives a much denser image and produces near-letter quality characters. A denser matrix also allows true formation of character descenders in such letters as p and q and helps to emphasize the difference between punctuation marks such as a period and a comma.

The quality of the output may be improved if the printer offers multimode operation. Such printers may be used in draft or default mode, or in emphasized or double-strike mode. In the latter two instances the line is printed twice. In emphasized mode the second printing is slightly off-set from the initial printing. Increasing the character pitch may also provide an increase in legibility. All these options lessen the great advantage of dmps — their speed. Slow dmps operate at about 40 cps but the more expensive, faster models will produce 180 to 200 cps and there are now some models, such as the Anadex DP6500, which produce 500 cps. Such speed ratings are commonly provided for printers; in the case of the dot matrix printer they are usually based on the slowest character because complex characters take longer to print. Two-way or bidirectional printing which allows the printer to print forwards and backwards removes the need for a traditional carriage return and increases speed. Logic seeking will allow the printer to determine the shortest route to the beginning of a new line and logic summing permits anticipation of, and hence speedier travel over, spaces within and between lines and between new paragraphs and new pages.

Another major advantage of dmps for geographers is their ability to produce graphics, and through the use of special software and print programs (see below), to produce superscripts, subscripts, foreign alphabets and mathematical notation. This is utilized to great advantage in the bit-mapped graphics employed in the Macintosh-ImageWriter combination which allows even the most complex manuscripts to be typeset (see, for example, MacWorld, 1985 (July)). Impact dmps can produce color output using

a four color ribbon. Usually the ribbon has black, and three primary colors. While TV monitors use red, green and blue, additive model color printing devices use the subtractive primaries, cyan (blue), magenta and yellow. Ledin (1984) notes that when dmps use a second pass to produce non-primary colors the print may appear dirty unless separate ribbons are used for each primary color. The output becomes lighter as the ribbon is used and since different colors are not used at the same rate the secondary and other mixed colors may also change with ribbon use.

Dmps do not require special paper, with the appropriate peripherals, they may be run with fanfold paper (for continuous printing), with letterhead, or even with address labels, envelopes and forms.

Dmps appear to have few disadvantages although the cheaper models do not produce characters with a high enough quality for most users' correspondence. They are, moreover, extremely noisy and range from 65 to 80 decibels (Ledin, 1984). In most offices where extensive printing is carried out, they would normally be housed in an acoustical enclosure thereby adding a further expense. Dmps range in price from US$200 to more than US$2,000. They have tended to be the most popular type of printer but may receive stiff competition in the future as the price of laser printers continues to fall.

Nine distinct models of Dickinson's (1985b) 16 best-buy printers use matrix impact technology. These include the C.Itoh Prowriter Jr at US$299, the Panasonic KX-P1091 at US$399, the Star Micronics SD-10/Sd-15 series at US$449 and US$599 respectively, the Epson FX-85/FX-185 at US$499 and US$699 respectively, the IBM Proprinter at US$549, the Star Micronics SB-10 at US$749, the Centronics Printstation 240 at US$1,495, the Toshiba P351 at US$1,895, and the Okidata Pacemark 2410 at US$2,395. Again it would appear that all these printers provide good quality output, low noise and good speed for their respective process. The Star Micronics SB-10, the Centronics Printstation 240 and Toshiba P351 are part of a new generation of 24-pin printers. The extra pins (most of the present impact dot matrix printers have only nine) mean that high quality output can be created without a second pass over the line while, of course, a second pass will provide exceptional quality. Covington (1985) provides a review of three other new 24-pin dot matrix printers: the Brother 2024L, the Epson LQ-1500 and the Fujitsu Dot Max 24. He argues that these high density dot matrix printers can serve as both high speed printers and letter quality printers avoiding the need for both types of printers in an office or lab. These printers are likely to become the industry standard very quickly. Some manufacturers are experimenting with 30- and 36-pin printheads.

Nonimpact Printers

Thermal printers. Thermal printers may be divided into two types: those that do and those that do not need a sensitized paper. Both types are essentially dot matrix printers. The former pass a ceramic plate behind the specially treated paper. The hot dots in the matrix turn the paper black and thereby create the character image. These printers have been available with small calculating devices but full-size printers are also available. Star Micronics produce the STX80 for US$199. The high cost of the paper is one of the main disadvantages of this printer and consequently they are unlikely to achieve any lasting popularity.

The second type of thermal printer does not use special paper but a thermal process. A special heat sensitive inked ribbon is used and transfers ink to the paper when the ribbon gets hot. Very high densities of dots may be achieved and dot addressable graphics are possible. A recent entry in this field, the IBM Quietwriter uses
pulses of electricity to perform the transfer process. Very high quality characters are achieved with the tiny dots but unfortunately at present the Quietwriter is not capable of bit-mapped graphics.

The only thermal printer which Dickinson (1958b) included in his 16 best was the Okimate 20; with its Plug 'n' Print module it retails for US$268. Although the printer produces better results with clay surface paper it can be used with ordinary paper. The Okimate will produce up to 20 colors using the

yellow, cyan and magenta primaries. The print quality is generally very good for such an inexpensive printer which has the added attraction of being compact and light.

Electrostatic printers. Electrostatic or electrosensitive printers use paper coated with a thin metallic layer. The printhead again is a matrix of wires which instead of laying down ink lift up the metallic covering on the paper when the wires become electrically charged. The character is produced by revealing the darker paper base beneath the metallic covering. These printers although using a dot matrix format are not impact printers. Electrostatic printers have the same disadvantages as thermal printers. The special paper printers have the same disadvantages as thermal printers. The special paper is hard to obtain and is comparatively expensive. The special paper is even less acceptable for presentations and since this is not an impact process, forms with carbons cannot be used.

It would appear that this type of technology is going out of fashion for microcomputer printers. None of Dickinson's 16 best is an electrostatic printer.

Ink jet and bubble jet printers. Ink jet printers by contrast are becoming more and more popular and over the last few years their cost has fallen dramatically. An early review and detailed description of this technology is provided by Kuhn and Myers (1979).

These printers work by spraying ink on to the paper. The flow of the ink is controlled by mechanical, electrical; or magnetic means depending on the model. Two technologies are used. Industrial printers use synchronous continuous stream techniques. The ink flow is controlled by electrical charges. Unused droplets are steered to a gutter and returned tot he reservoir for subsequent use. The second method, used in less expensive models, is asynchronous drop-on-demand. Each nozzle supplies a drop of ink on demand which is signalled by electrical charges.

The quality of the characters is often poor although some of the more expensive models such as the Epson SQ-2000 (US$2,500) do produce near letter-quality output. They are very quiet and most are rated in the 50 decibel range. They also produce excellent graphics and colors. Colors are produced using additional nozzles and print quality does not fade as it does when a ribbon or ribbons are used to produce a color effect. Good quality paper reduces the likelihood of ink seepage. Ink jet printers like thermal and electrostatic printers have fewer moving parts which helps to reduce maintenance problems. There is a tendency though for the nozzles to become clogged with dry ink. Canon has recently developed a bubble-jet printer which combines speed of operation with a very low noise rating.

Dickinson rates the Epson SQ-2000 as one of the 16 best new printers; it is the only ink jet printer to make it into his top 16. Townsley and Venning-Townsley (1985a) provide a glowing review of five ink jet printers; the Diablo C150, the Hewlett-Packard Think Jet, the Quadram Quadjet, the Siemens PT88 and the Siemens PT89. The C150 is recommended for its excellent color graphics while the Think Jet's speed and portability are praised.

Laser or xero-graphic printers. Laser printers are not new. One of the earliest models, the Xerox Graphics Printer, was developed by Xerox at Palo Alto in the early 1970s and distributed mainly to universities. Until a few years ago laser printers were only used in conjunction with mainframe computers and could cost more than a quarter of a million dollars. Now there are half a dozen or more good quality, inexpensive laser printers on the market suitable for attaching to microcomputers. They are still expensive and sell for around US$7,000 although models such as the Hewlett-Packard LaserJet and the BDS laser 630/8 sell for US$3,495 and their price is still dropping as they proceed through a price/performance revolution. One reason for the rapid drop in price is that many of the new laser printers, including the HP LaserJet and Apple's LaserWriter, have simply adopted technology from a standard office copier, the Canon PC-2. Laser printers use a laser beam, which unlike the ink jet, can be controlled precisely and is directed either at photographic film or paper as in a conventional phototypesetting machine. Canon's engine is called the LBP-CX and contains a small semiconductor laser emitting a pulsating stream of light which is then reflected off a hexagonal mirror. This mirror rotates

allowing it to scan the width of a drum; when hit by the light, the drum becomes electrically charged and attracts the toner. The image is transferred when the drum comes in contact with the paper by a combination of heat and pressure, similar to that found in standard copiers. More details are contained in Harts (1985).

Christian (1985) notes that there are three approaches to drawing figures in the computer business. One approach is to use vector technology normally found on pen plotters drawing lines from point to point. This produces excellent drawings with fine resolution (reasonably priced plotters for the IBM PC have a resolution of 1/1000 inch). They are slow in producing drawings and with text accompaniment, their output is poor. The second method of producing drawing is to use fully formed characters, a solution found in the SYMAP mapping program. The dot matrix approach originally advanced by a group of artists known as the pointillists in the nineteenth century, seems likely eventually to emerge as the winner. To avoid the "jaggies" (a jagged appearance to straight lines or curves) the dot matrix solution requires extremely high resolution. Dejagging can also be produced by antialiasing techniques allowing the dots on the outside of the line to be printed in light shades (Foley and Vanam, 1982:436). These procedures are not available at the present time on low cost laser printers.

Laser printers commonly provide a resolution of 300 dots per inch (dpi) — about four times that of the better impact dumps — but many of the more expensive laser printers are capable of even higher densities. Dmps which are used for graphics purposes allow each dot to be controlled through a process known as All Points Addressable (APA). Thus an image is produced by having the computer send a bit pattern to the printer which informs the printer exactly which dots to print. On a traditional impact dmp the printhead will pause while the computer refills the buffer with another print pattern. With laser printers the mechanics are different. There is no pause once the print cycle begins and consequently the full page of text of the complete image must be held in memory. On an 8.5 by 11 inch page at 300 dpi there are about 2,550 by 3,000 addressable points which require about a megabyte of memory for storage. Memory poor laser printers have options that either lower the resolution or have print cycles with less than a page. Apple's LaserWriter is outstanding in this area ("awesome" according to Petzhold, 1985) and comes with 1.5 megabytes of internal RAM memory for data storage and 0.5 megabytes of ROM memory for program and font-style (Goodman, 1985:73).

Dickinson includes only one laser printer in his best 16, the Apple LaserWriter. Like most laser printers it is quiet (less than 60 decibels), fast (up to eight pages per minute — laser printers are in pages per minute, ppm, rather than cps) and produces outstanding quality text and graphics. It is relatively inexpensive at US$7,000; although not the cheapest, it utilizes the revolutionary PostScript printer control language to full advantage (see below). It is also the printer the Department of Geography at the University of Calgary has chosen as its main workhorse for the foreseeable future.

The Future

Dickinson (1985c) notes that lasers are certainly not the last word in moving and delicate parts to rotate the imaging mirror. Rosenthal (a985) discusses some of the new technologies with which firms are now experimenting. These include light-emitting diode (LED), liquid crystal shutter (LCS) and magnetic printers. These three technologies are in many ways very similar to the technology used in laser printers but differ mainly in the way that they prepare the printing drum for the toner to produce the final image. The light producing the image on the drum of a LED printer comes from closely spaced light-emitting diodes. Light in an LCS printer is from a fluorescent lamp blocked by an electronically controlled liquid crystal shutter. Light not blocked then produces the image on the surface of the drum.

Magnetic printers use a head that slides over the drum leaving a magnetic pattern to pick up a special toner with a slight iron content. This magnetic approach leaves a non-volatile pattern after the head has passed allowing multiple copies to be printed. Moreover, the whole image does not have to be created in a single pass which means that a smaller amount of RAM is required or alternatively a higher

resolution image may be produced in the APA mode for a given amount of RAM. This provides much higher quality graphics. Ferix Corporation has produced a magnetic printer whose magnetic dots are claimed to be sharper than those created by optical procedures and to produce lines with a width of a single dot. NEC Information Systems are producing an LED printer which will compete directly with laser printers for resolution, speed, and price. Casio Computer Company is selling an LCD mechanism to OEMs (original equipment manufacturers). Epson, the leading printer manufacturer in the world, is also experimenting with this technology and may have a competitive model available in the near future.

Ion printers have been developed which bombard the print drum with charged particles as opposed to removing the particles with light as in optical printers. These printers are, at present, only available at enormous cost fro mainframe computers — but that was said about laser printers a few years ago. The Philips company in Europe is now experimenting with a thermal-magnetic-optical process, which despite its Rube Goldberg/Heath Robinson complexity, has no moving parts. Philips Peripherals has produced the ELPHO 20 using a projection CRT to cast the image on the print drum. It costs US$20,000 but runs at a staggering 20 ppm.

SOFTWARE

Printer Utilities

Special printer utility programs are useful for maximizing the potential of a printer. Poor (1985) reviewing 12 such programs, notes that they have various levels of sophistication. At the lowest level are the printer configuration programs which set the printer up in a particular mode using parameters already built into the printer. The problem with these utilities is that many application programs will reset the parameters leaving the printer in the default font.

At the second level are programs like SideKick which reside in memory and may be called while running an applications program. These programs allow settings to be changed from one document to another but not in the middle of a document.

At the third level are programs which allow the user to employ either the printer's fonts or fonts from the utility which can be downloaded into the memory of some printers. The best font utility programs allow control of the printout and changes in font style using embedded commands. This may require several passes over each line thereby decreasing the printer speed significantly.

Grout (1985) describes the MegaForm program which allows users to design forms on a 512K Macintosh. The mathematics capabilities of MegaForm are not as impressive as many spread sheet programs commonly in use, but the graphics capabilities are truly impressive; when used in conjunction with a laser printer, they can produce very professional looking forms. This might be a particularly useful program for geographers wishing to design their own data collection sheets. This program will even pull information out of the MegaFiler database in order to complete the form.

Postscript

Postscript (Jeffries, 1985) is a printer control language which was developed by Adobe Systems, Inc., of Palo Alto and is credited with providing the Apple LaserWriter with much of its power. Adobe has also concluded agreements with QMS and Dataproducts for the use of Postscript on their laser printer. Postscript is a full programming language. It is a stack-oriented or Reverse-Polish language similar to FORTH which provides detailed control over the printer together with a large number of special graphics operators. Speed is achieved by storing typeface as compact outlines. Character bit maps are stored in memory after use and will remain there if they are used frequently. The outline can be manipulated mathematically allowing rotation, translation, scaling and other operations. Postscript may well become

the industry standard for controlling laser and other dmps although it is facing competition from Xerox's Interpress protocol.

PERIPHERALS

Interfaces

In order to hook printers to computers, a special cable is required together with an interface. Either a serial or a parallel interface can be used. The serial interface carries only one bit of information at a time whereas the parallel interface can carry a bit of information down each data line. With eight data lines in the ribbon all eight bits will be transmitted simultaneously. Most printers have two ports. These are commonly an RS-232-C serial and a Centronics-compatible parallel port. This allows their interface with most computers although there are other interfaces.

Buffers

Buffers which store information passed to the printer, may be purchased separately; they allow the user to continue computing while a document is being printed. As noted above, they require about 2K of memory to store a double-spaced page of output. Buffers are now expensive but are becoming cheaper all the time. The Quadram Microfazer comes in 8K, 16K, 32K and 64K model; it sells for US$169, US$189, US$225 and US$299 respectively.

Acoustical Sound Enclosures

Enclosures are essentially sound-insulated boxes which fit over the printer and reduce the noise level on impact printers. They frequently come with cooling fan and range in price from US$100 to US$1,000.

SELECTING A PRINTER

Ledin (1984) suggests that before buying a printer, the purchaser should make a checklist including the following: 1) type of paper to be used; 2) paper size; 3) the importance of graphics; 4) quality of type face; 5) the number of fonts to be used; 6) number of sheets to be produced per week; 7) whether noise is a problem; 8) maintenance costs in terms of supplies and mean time between failures; 9) requirement for a printer utility; 10) need fro peripherals such as buffer acoustical enclosures and stands; and 11) monies available for the purchase. Schwartz (1985) offers similar advice on printer selection and even provides a formula for working out the appropriate printer speed depending on your rate of production. Simply put, one cps is needed for every four pages produced per week. A printer rated at 125 cps is required if 500 pages per week are produced. This simple calculation omits consideration of printer buffers and other variables.

CONCLUSION

The final word on choosing a printer should be given to Norton (1985) who points out that far too many printers are being produced; this, together with the frequent duplication of features, adds to the difficulty of making a sensible choice. Norton advises potential purchasers to stay with major manufacturers who are not likely to be forced out of business in a few years and who will be around to provide service for your printer which, with its many moving parts, is the most service-prone part of any microcomputing system.

REFERENCES

CHRISTIAN, K. (1985), *Lasers get graphic, PC: The Independent Guide to IBM Personal Computers*, 4(19):211-214.
COVINGTON, B. (1985), *Three high quality printers, Creative Computing*, 11(27):38-40.
DICKINSON, J. (1985a), *Printers, PC: The Independent Guide to IBM Personal Computers*, 4(19):92-96.
DICKINSON, J. (1985b), *Editor's choice, PC: The Independent Guide to IBM Personal Computers*, 4(19):194-198.
DICKINSON, J. (1985c), *Laser printers, PC: The Independent Guide to IBM Personal Computers*, 4(19):208-209.
FOLEY, J.D. and VAN DAM A. (1982), *Fundamentals of interactive computer graphics* (Reading, Mass: Addison-Wesley).
GOODMAN, D. (1985), *The Laser's edge, MacWorld*, 2(2):70-79.
GROUT, B. (1985), *The Mac goes pro forma, MacWorld*, 2(7):84-88.
HARTS, B. (1985), *The little engine that could, PC: The Independent Guide to IBM Personal Computing*, 4(19):210-211.
JEFFRIES, R. (1985), *An important PostScript, PC: The Independent Guide to IBM Personal Computing*, 4(19):77-80.
KUHN, L. and MYERS, R.A. (1979), *Ink-jet printing, Scientific American*, 240(4):162-179.
LEDIN, V. (1984), *How to Buy and Use a Printer* (Sherman Oaks, Calif.: Alfred Publishing Co. Inc.).
NORTON, P. (1985), *The Peter printer principle, PC: The Independent Guide to IBM Personal Computing*, 4(19):69-73.
PETZHOLD, C. (1985), *Review of Apple LaserWriter, PC: The Independent Guide to IBM Personal Computing*, 4(19):177-180.
POOR, A. (1985), *Printer utilities, PC: The Independent Guide to IBM Personal Computing*, 4(19):219-240.
ROSENTHAL, S. (1985), *Electro-optical printers beyond the cutting edge, PC: The Independent Guide to IBM Personal Computing*, 4(19):214-216.
SCHWARTZ, E. (1985), *Printers: Buyer's Guide and Handbook* (New York: Computer Information Publishing Inc.).
THOMPSON, K. (ed.) (1985), *PC Buyers Guide* (New York: Ziff-Davis Publishing Company).
TOWNSLEY, D. and VENNING-TOWNSLEY, F. (1985a), *Meet the ink jets, A+: The Independent Guide to Apple Computing*, 3(7):48-59.
TOWNSLEY, D. and VENNING-TOWNSLEY, F. (1985b), *Dot matrix printers = low cost speed and flexibility, A+: The Independent Guide to Apple Computing*, 3(8):26-36.

HELP WANTED — SALES

FOR SALE

The Library Research Center has for sale a TECMAR QIC-60 streaming tape-drive backup system for the IBM personal computers. The QIC-60 is a 60MB tape cartridge backup system for backing up floppies and hard disks on IBM PC, XT and AT, as well as any other true compatible.

The QIC-60 software is very extensive containing all sorts of backup and restore utilities which can be run individually or through the master menu program. You may backup and restore whole disks, directories and/or associated subdirectories, as well as individual files. The system comes with complete documentation.

Backup time is excellent, about 9 minutes for 20MB, restore time is comparable. Tape space is only used as needed. If an AT drive has only 10MB of data then only 10MB of the tape is used, with up to 60MB per tape.

The QIC-60 requires that an interface card be present in the host computer, but the QIC-60 may be moved from machine to machine as long as there is an interface card present in the intended machine.

The QIC-60's speed, capacity, and ease of use makes it ideal for archiving, large file storage, and weekly or daily backups. I use it most frequently for "taking pictures" of the hard drive while I am working to insure that I have backups before I make a major change to the disk.

The QIC-60 is reviewed in PC magazine, Volume 5, Number 3, February 11, 1986, page 121.

We are purchasing a 1/2 inch tape drive which can read IBM format tapes. This 1/2 inch drive will also serve our backup needs so we are looking to sell the TECMAR QIC-60.

Our setup includes the QIC-60 drive (list at $2144), four tapes (about $20 each) and four interface cards ($160 each). **The total price is $2864, but we are asking for $2000.**

If you are interested or have any questions, call Powell at 333-1980, Monday-Friday, from 10:00 am until 1:00 pm.

BMDPC & SPSS/PC+ INTEREST SURVEY

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*CSOB is the new CSO Office Building, 101 S. Gregory, Urbana.

Academic and research computing is done on the following machines: CDC Cyber 175 running NOS 1; CDC Cyber 174 running NOS 2; IBM 3081 running VM; IBM 4341 running VM; VAX 11/780 running UNIX and driving a GSI CAT-8 phototypesetter; three Pyramids and a Sequent running UNIX. In addition CSO serves as Facility Manager for various departmental machines (e.g., other IBMs) and for the National Center for Supercomputing Application's CRAY X-MP.

Operating Hours (see HEARYE,SCHEDUL for exceptions):

	CYBER 174/175	IBM
M-F	8 am - 6 am	8 am - 6 am
SAT	8 am - Midnight	8 am - 6 am
SUN	Noon - 6 am	Noon - 6 am

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ABOUT OFF-LINE'S NEW LOOK

Lynn Bilger, Editor

Along with the many new and exciting changes occurring at CSO, we are in the process of "changing our documentation image." The first step in this process has been to add a new look to our newsletter. Some of the upcoming changes will include new sections to be added in future issues, such as a question/answer section, more articles about the use of computers/microcomputers in various departments on campus, and so on. First, however, we decided to redesign our newsletter cover. To do so, we enlisted the services of two students who have a great deal of talent in the area of graphic arts and design. We are extremely pleased with their new design and we anticipate that you, our users, will like the "new look" as well as we do. The following article was written by Colleen and Diane to tell you a little about themselves and to describe the theme of the cover design.

MEET THE DESIGNERS OF OUR NEW COVER

Colleen Bannon & Diane Schwartz

The cover design was created by Colleen Bannon and Diane Schwartz.

Colleen has a bachelor's degree in Graphic Design at the University of Illinois and is currently enrolled as a graduate student. She is also currently working for Agricultural Communications.

Diane will receive a bachelor's degree this May in Computer Graphics. She has developed an Independent Plans of Study program to complete this field of interest. Her future is uncertain at the writing of this article.

The cover as a unit represents the organization of Computing Services Office as a whole. The work of the individuals working in CSO and combining efforts is expressed as well.

The emphasis of this cover design is on interrelationships in and through computers. Networking is the most important of these interrelationships. Networking involves a sharing of ideas; a coming together from all areas. This concept is shown through the various blue and gray lines converging to a central region to share knowledge, and then venturing out in different directions. These clean and precise lines reflect the exactness needed when working with a computer whether programming or simply using a software package.

SYSTEMS AND STATISTICAL CONSULTING SERVICES

Ahmed Kassem

The User Services division of CSO consists of several groups whose primary goal is to keep the user community informed of changes in current CSO services and the availability of new services. It is also the purpose of this group to simplify access to CSO's computing resources.

One of the most visible of these groups is the Consulting Services group. The role of the consulting group is to provide information and assistance to students, researchers, and university faculty and staff who use, or may want to use, the CSO facilities. This article summarizes the

services that the consultants provide for our user community. (NOTE: This article discusses only the Systems and Statistical Consulting Services. PC Consulting and Text Processing Consulting Services also are offered to our users, but these services are not discussed here.)

Consulting services are available to all members of the university community free-of-charge on a walk-in basis or, in some special cases, by appointment. These services are available for all phases of computing. The consultants help students in diagnosing errors and selecting appropriate software (note that students in some classes are required to see their instructor for help rather than a consultant). The consultants also provide information about the available resources to faculty and staff to help them determine which facilities to use for their classes or research projects.

Over the last year CSO has experienced a rapid growth which has entailed many changes. During this period, our consultants have met the challenge of learning new operating systems, and have increased their depth of knowledge in many applications. In an effort to provide the university community with a single service source, the consulting staff is becoming increasingly responsible for installing, as well as learning, about many applications software products on all systems. The consulting staff also is involved in planning, evaluating, selecting, modifying, and testing software on all the systems, and in teaching short courses about the various systems and software products.

Currently, the Computing Services Office offers consulting services at two locations on campus:

Systems Consultants: 1208 W. Springfield, Urbana (333-6133)

Statistical Consultants: 85 Commerce West (333-2170)

The two offices are staffed by professionals with backgrounds in the available operating systems (NOS, VM/CMS, UNIX).

Systems Consulting Office, 1208 W. Springfield

The Systems Consultants assist users in the following ways:

- Diagnose errors caused by programs or equipment failure.
- Recommend appropriate software packages and documentation for the user's application.
- Assist users in analyzing program logic errors and interpreting diagnostic messages.
- Provide assistance in special mathematical applications.

Statistical Consulting Office, 85 Commerce West

The Statistical Consultants provide the same general services, but specialize in the following:

- Recommend appropriate statistical packages.
- Provide advice on the use of statistical packages and documentation, and how to interpret the computer output from the packages.

- Analyze program errors and explain error messages.
- Provide assistance on major statistical packages on both the mainframes and on PCs.

Weekly schedules showing which consultants are on duty are available on-line on both the Cyber and IBM systems by entering either of the following system commands:

SYSCON displays the Systems Consulting Office schedule (1208 W. Springfield)

STATCON displays the Statistical Consulting Office schedule (85 Commerce West)

Each consultant possesses a broad range of experience in assisting users with their computing needs. However, due to the availability of so many software products, our consultants have developed individual areas of expertise to provide more in-depth consulting to the university community.

To acquaint you with our staff, I am now going to introduce to you the "cast" of consultants.

(NOTE: Recently the Consulting Staff's personal offices were moved from DCL to the new CSO Office Building [CSOB]. Although consultants' offices, telephone numbers, and machine signons are listed in the following brief biographical sketches, all user contact with consultants should be through CSO's official Consulting Services Offices, unless a consultant has specifically told you to contact them at their personal office.)

Stan Kerr

Stan Kerr is the Head Consultant for the Systems Consulting group. Stan joined CSO in 1975 as a part-time consultant, and went to full-time in 1976. He has a master's degree in mathematics, obtained at the University of Illinois. He has been very active in obtaining, installing, maintaining and consulting on the mathematical packages on the CSO systems. Stan consults on the general use of the Cyber and IBM systems, but his areas of expertise are in Fortran and the various mathematical packages, such as IMSL. Stan's office is 208 CSOB (333-4715) and his principal computer signons are 3K9NYTD on the Cyber 175 and STANKERR on VMD.

Joan Alster

Joan Alster is the Head Consultant for the Statistical Consulting group. Joan has master's degrees in both statistics and computer science from the University of Illinois. She has worked in the area of statistical computing on this campus for over ten years, first in the College of Medicine and for the past three years, at CSO. She consults in the use of all the major statistical packages on campus, but specializes in SAS (particularly SAS data management issues). She also specializes in general linear models procedures (primarily SAS GLM and SPSS MANOVA), and their use for analysis of data from repeated measures experiments. Joan's office is 202 CSOB (244-0937) and her principal computer signon is ALSTER on VMD.

Christopher Albin

Chris has a BS in chemistry and currently is pursuing a master's degree in computer science. He works half-time as a consultant for CSO. He feels that he can be most helpful in the following areas: Cyber (system interpretation, program debugging, text processing), graphics (EZGRAPH, BLAZE, and some DI3000), tape usage on the Cyber, and general help on the UNIX system. Chris' office is 210 CSOB (244-1205).

Vicky Dingler

Vicky has a master's degree in education from Georgia State University. She started work at CSO in February of 1984 as a half-time research programmer and went full-time in August of 1984. Before coming to CSO, she worked with a local computer firm. Vicky serves as the CSO SAS Coordinator. In this position, her duties include installing and maintaining the SAS system on VMD, VME, and CSRD mainframes, and very soon, the IBM PC and compatibles. She consults on various statistical software packages, but her main areas of expertise are with SAS on both the mainframes and the PC, and with SAS/CMS interface issues. Vicky's office is 201 CSOB (333-4668) and her principal computer signon is DINGLER on VMD.

Esther Edwards-Iwe

Esther joined the CSO staff in 1982. Her undergraduate work was in economics/management and her graduate work in MIS (Management Information Systems). She has an extensive background in econometrics and database management systems. As a Systems Consultant, Esther consults on general use of the Cyber, IBM and UNIX systems. Her primary area of interest is in large scale data management/database modeling, with expertise in software packages such as SHAZAM, TSP, UWRIM and TAGS. Esther's office is 210 CSOB (244-1204) and her principal computer signons are 3SDYNT3 on the Cyber 175, ESTHER on VMD, and iwe on the UNIX system.

Beth Engelbrecht-Wiggans

Beth joined the CSO staff in November 1985, which makes her our newest full-time consultant. Her undergraduate work was in applied mathematics, and her graduate work was in the industrial engineering field. Beth is with the Systems Consulting Office and can help users with most Cyber and CMS questions, including operations, tape usage, Fortran programming, and with some software packages. Her latest project has been to install VMSECURE on the VMD system. Beth's office is 205 CSOB (333-8627) and her principal computer signon is ENGWIG on VMD.

Ken Gengler

Ken is currently a senior in computer engineering and will be starting graduate school in the fall in the area of artificial intelligence and theory of computation. He was an RJE operator for CSO for 2 1/2 years before joining the consulting staff this year. He consults in the general area of NOS, CMS, and some UNIX. Ken's office is 210 CSOB (244-1205).

Bruce Gletty

Bruce Gletty joined the CSO staff 12 years ago. He is a University of Illinois graduate in electrical engineering and computer science. Although Bruce does general consulting on the Cyber and IBM systems, his areas of expertise are with the operating systems, control languages, PL1 and Fortran programming. His office is 164A DCL (333-5305) and his principal computer signons are 3LFMXFY on the Cyber 175 and GLETTY on VMD.

Greg Kesner

Greg has been with CSO for 8 of the last 12 years. He started as a student employee and joined the staff full-time in 1981. He has a degree in linguistics from the University of Illinois. Greg is currently the Facilities Manager of the CSO South computer site and the System Administrator for the UIUCVME IBM computer (primarily used for student computer coursework). Due to these responsibilities, his consulting is limited to part-time. He is also coordinating the development of the UIUC CMS Users Group. Greg's areas of expertise include SAS and CMS. He has considerable experience working with mainframe statistical packages and the Cyber system. Greg's office is 85 Commerce West (244-0540), and his principal signon is KESNER on UIUCVME.

Joan Mills

Joan came to the University as a graduate student in mathematics in 1963, and joined CSO in 1964. She now has her master's degree in mathematics and has done advanced study in educational psychology quantitative methods. She is with the Statistical Consultant group and consults on most of the major statistical packages, including SAS, SPSS, BMDP, SHAZAM and IDA. Joan was involved in the development of a locally-written statistical package. She now maintains CMS BMDP on VMD and is the coordinator for SPSS/SPSSX products, including SPSS Graphics and IDA. Joan's office is 204 CSOB (333-2172) and her principal signons are 3IEUZMN on the Cyber 175 and MILLS on VMD.

Daniel Pommert

Daniel has a BS from the University of Washington in mathematics with an emphasis in numerical analysis. He came here in 1977 to do graduate studies in computer science, and has been working full-time for CSO since 1980. He has general knowledge of the Cyber, IBM and UNIX systems with specialized knowledge in programming languages (including Pascal, CCL, and Rexx), math packages, text processing (RNF-2 and the Roff family), UNIX (shell scripts, make files, programming), simulation (especially SIMULA, SLAM and GPSS), and micros (especially the Apple Macintosh). Daniel's office is 205 CSOB (333-8629) and his principal computer signons are 3QZN8XY on the Cyber 175, DANIEL on VMD, and pommert on UNIX.

Bruce Richardson

Bruce got his BS in statistics and economics and his MS in statistics at the University of Illinois. Although he consults on the statistical packages in general, his expertise is in the statistical aspects of experimental and observational research. He is quite familiar with SAS, SPSS and S. He is also involved with the sharing of user-supplied software on VMD. Bruce particularly enjoys working on non-standard (i.e., no prepackaged solution exists) problems, SAS data management and statistics on microcomputers. Bruce's office is 201 CSOB (244-1202).

Anup Roy

Anup recently joined the Statistical Consulting staff. His undergraduate work was in mechanical engineering and his graduate work in business and industrial engineering. Although he is knowledgeable about the Cyber and IBM systems in general, and the statistical packages on these machines, his special area of expertise is in statistical packages on the IBM PC and compatibles. In particular, he has been working with PC versions of mainframe packages such as BMDPC, SAS and SPSS/PC+ and is currently working on making these packages available to our users. He is the CSO coordinator for SPSS/PC+, SAS/ETS, and SAS/IML. Anup's office is 201 CSOB (244-1201); his principal signons are 3LLXL8M on Cyber and ANUPROY on VMD.

Beth Scheid

Beth joined the CSO staff as a student in 1981 and became full-time in 1984. She has a background in computer science and mathematics. Although Beth does general consulting on the Cyber, IBM, and UNIX systems, her specialty is in Cyber Graphics. Her consulting expertise in this area deals with the DI3000, BLAZE, CONTOUR, NCAR, ZETA and EZGRAPH packages, and the Zeta 1453 plotter. Beth's office is 204 CSOB (333-8626) and her principal computer signon is 3KVPYOL on the Cyber 175.

Becky Wetzel

Becky has a master's degree in library science from the University of Illinois and has been a Systems Consultant with CSO since 1968. Although she is knowledgeable about both the Cyber and the IBM systems, her particular expertise is in the areas of Fortran programming, using the BITNET network, the SPIRES data base management system, and the use of tapes. Becky's office is 206 CSOB (333-8628) and her principal signons are 3JQMB9F on the Cyber 175 and BECKY on VMD.

WHEN CAMPUS COMPUTER USERS TALK... WE INTEND TO LISTEN

Greg Kesner

With the explosion of computer technology available on the UIUC campus over the last year or so, the CSO staff has been discovering we need new strategies for both learning of your computing needs and providing you with high quality computer services to meet them. In the exciting, yet also sometimes hectic development of new services like the expansion of IBM CMS services, the EXCEL PC project support, campus networking, and some foundational support for the National Center for Supercomputing Applications, we are concerned that we may have lost touch with some of you. We never want this to happen. To remedy this or prevent it from happening, we are now implementing a way to facilitate our hearing your ideas and suggestions.

There is now a SUGGEST command available on the IBM VMB, VMC, VMD, VME, and the Cyber NOSA computers which you may use to submit your suggestions, ideas, questions, comments, complaints and commendations to CSO management. To execute the SUGGEST command, simply enter:

```
SUGGEST
```

The SUGGEST command places you into the electronic mail facility of the computer on which you invoke it. Your suggestion is then sent to the CSO userid on the VMD computer to be read by Mr. Ahmed Kassem, the newly appointed CSO Assistant Director for Campus Computing. Mr. Kassem will either respond to your suggestion directly, or he will pass it on to a CSO staff member for consideration or investigation. In either case, you will receive a reply acknowledging receipt of your suggestion and an indication of what action is being taken in response.

Though the SUGGEST command is not intended for consulting questions, we do encourage you to use this facility to communicate ideas or questions you have about the present state of campus computing and any needs you see unmet by current services. Feel free also to tell us what you think we are doing right — we need to hear that, too!

Your perspective, your insights are necessary to help us develop and tailor our services to adequately meet both your present and future computing requirements. Your input will also be very valuable in our planning. Though we can not promise to follow every specific suggestion, we will make our best effort within the context of budgets, available staff, and the overall campus computing scene. For issues or questions raised by a number of people, we will publish a response in our monthly newsletter, *Off-Line*. And if you are ever dissatisfied with the response you receive to your suggestion, you are invited and encouraged to write Mr. Kassem at the following address:

Mr. Ahmed Kassem
Assistant Director for Campus Computing
Computing Services Office
150 Digital Computer Lab

So, if there was ever a time to tell us your ideas — it's now. We hope the SUGGEST command will help facilitate this. Let's communicate!

CARD READERS TO BE DROPPED FROM SERVICE

CSO will drop support of the two card readers at 453 Psychology and 144 Electrical Engineering as of June 1, 1986. This is pursuant to announcements made in the past that this service would be dropped. If you have data stored on cards, you should make every effort to get it read in before June 1. After that date, some off-campus service for reading cards must be used.

NOS 2 AND CYBER 174 TO BE TAKEN OUT OF SERVICE

After extensive discussions about the continuation of service on the Cyber 174 and the vast amount of time and effort that would be required to bring the NOS 2 operating system (and necessary software) into an acceptable range of service, CSO has decided to retire the Cyber 174 (and NOS 2) at the end of this semester. Users currently using the limited services available on the 174 will be shifted back to the Cyber 175. The NOS 2 advantages to users were too small, particularly with the likelihood of another conversion to a successor machine within two to three years.

This changeover will occur June 17.

During the Spring semester, NOS 2 on the Cyber 174 was offered on a limited basis for classes only. Instructors who need assistance in moving their files to the Cyber 175 should contact the CSO Consulting Office.

At the same time, the mass store problem is being solved, and a number of lines are being consolidated (e.g., Sytek, dialup, etc.).

CSO'S IBM VM/CMS SPOOL FILE POLICY

Bruce Gletty

In order to keep system spool space from filling up, CSO deletes spool files on a regular basis. If the system spool space ever did fill up, users would not be able to print anything, and files sent from machines other than VMD (NOSA, NOSB, VME, etc.) would tend to get lost.

There are three types of spool files — reader, printer, and punch. Reader files are files on your virtual reader that someone (possibly yourself) has sent to you. Print files are files on your virtual printer that were not sent anywhere or to anyone. Punch files are files on your virtual punch that were not sent anywhere. You can use the TRANSFER command to transfer your printer and punch files to reader files so that you can look at them. CSO purges spool files of each type differently:

- READER FILES are split up into mail and non-mail. MAIL files are purged if they are over one month old. NON-MAIL files are purged if they are over two weeks old. Extra large mail files are treated as non-mail files. Extremely large files will be purged regardless of age if the system spool space is becoming critically full.

- PRINTER FILES are purged if they are over one day old.

- PUNCH FILES are purged whenever CSO does a cleanup, regardless of age.

NOTE: Spool files are never backed up. Once they are purged (either by CSO or by you), they are lost. Spool files lost in a hardware disaster are also unrecoverable.

VERSION 3.0 OF SLAM II ON CYBER

Stan Kerr

Version 3.0 of the SLAM II simulation package has been installed on the Cyber 175 and can be accessed by the command

```
GRAB,SLAM/F
```

This will become the default version on June 1, 1986.

CSO has been running version 2.0 of SLAM II for some time. We "skipped over" version 2.3 for lack of time to install it. Version 3.0 includes the following features combined from the 2.3 and 3.0 releases:

- Access to current resource utilization (Function NRUSE)

- Dynamic control over the trace report (Subroutines TRACE, UNTRA)

- Access to the STOPA function in a network (ASSIGN node)

- Time-persistent histograms (TIMST statement)

- Optional warning of destroyed entities (GEN statement)

- More accurate algorithm for statistical calculations

- Zero-capacity QUEUE nodes.

- BATCH and UNBATCH nodes

- EQUIVALENCE definition to name attributes and variables

- ARRAY definition for user-defined table data

- DPROB variable allowing network use of Function DPROB

- GGTBL variable allowing a table look-up from the user-define global table
- Plotting of network variables (RECORD statement)
- Access to plot data (Subroutine PPLOT)
- User-assignable RESOURCE and GATE numbers
- Additional labeling of file and activity statistics
- Expanded input and execution error messages

The Systems Consulting Office at 1208 W. Springfield has an updated copy of the *SLAM II Quick Reference Manual* from Pritsker and Associates.

CHANGE IN ACCESS TO SPICE PACKAGE ON CYBER

Stan Kerr

Because of a recurring problem apparently associated with the GaAs-FET modifications to SPICE last year, the means by which SPICE is accessed will change at the end of the Spring semester. The default version of SPICE, accessed with the command

```
GRAB,SPICE
```

will revert to the previous version without the GaAs-FET abilities. The command

```
GRAB,SPICE(GAAS
```

will be required to access the modified version of SPICE.

The only symptom of the problem with SPICE has been that, in at least two instances, a SPICE model which did not use any of the GaAs-FET abilities was unable to run because of an infinite loop. In each case, the model was run and produced satisfactory results (in a short run time) on the old version. The problem has been reported to those who supplied the modifications to SPICE.

VS/FORTRAN UTILITY SUBROUTINES ON VMD

Stan Kerr

The IBM VS/Fortran Utility Subroutines library has been installed on VMD, and can be accessed by the command

```
LINKTO UTILITY
```

This makes the library available. You then need only compile and run a VS/Fortran program which calls the routines.

The most important facilities which this library makes available are:

1. The ability to execute a CMS or CP command from within a Fortran program. (Not all CMS commands can be executed; see the help information on this.) Routine CMSCMD performs a CMS command, and CPCMND performs a CP command.

2. The ability to dynamically open a Fortran unit with a specific CMS fileid. This can be done using routine UOPEN.

3. The ability to find out the date, time, and CPU time used by the running program. This can be done using routines DATE and DATETM.

4. The ability to create a special fast form of direct-access file, called a "UTILITY" direct access file. These files are created and manipulated only using the routines of the UTILITY library.

There are on-line help files for the UTILITY routines, and the source of the routines can be accessed as well. A general help file can be viewed at any time by entering the command

```
HELP CSO UTILITY
```

and a complete set of help files for the routines can be viewed by first entering the LINKTO UTILITY command, and then entering

```
HELP UTILITY MENU
```

Source of the UTILITY routines can be viewed by entering the command

```
LINKTO UTILITY SOURCE
```

This makes the source files available as individual files of filetypes FORTRAN and ASSEMBLE.

IMSL REBUILT WITH VS/FORTRAN RELEASE 4.1 on VMD

Stan Kerr

The IMSL library has been recompiled with VS/Fortran release 4.1 (the current version), and is available via the command

```
LINKTO IMSL (F
```

This version will become the default version of IMSL on **June 1**. After that time, those people who are running binaries which were compiled with the old (release 1.0) version of VS/Fortran, and are calling IMSL routines, may need to recompile their programs. If the programs are not calling any IMSL routines with character string parameter, the old binaries should run properly.

VS/FORTRAN INTERACTIVE DEBUG ON VMD

Stan Kerr

IBM's Fortran Interactive Debug has been installed on VMD. This package allows one to execute a Fortran program in a special debugging environment. In this environment, you can examine the contents of program variables, set breakpoints which will cause the program to be stopped at specified places so you can examine its behavior, and execute the program.

VS/Fortran Interactive Debug can be installed in a full-screen version using menus, or in a command driven version. CSO has installed the latter, and is investigating whether it is worthwhile to install the menu-driven version. A brief CMS help file exists under the CSO category describing Interactive Debug. This help file is accessed by entering

```
HELP CSO FORTIAD
```

Fortran Interactive Debug is accessed by entering the command

```
LINKTO FORTIAD
```

This makes available a disk which contains the software for Interactive Debug, as well as various help files. It also sets up certain libraries and CMS FILEDEFS which are needed to run Interactive Debug. There are two sets of help files on this disk, in categories DDB and TASK. If you enter

```
HELP DDB MENU
```

you will see a set of help files for the various Interactive Debug commands. If you enter

```
HELP TASK MENU
```

you will see a set of help files designed to give information on particular tasks to be performed within a debugging session.

To use Interactive Debug, you must first compile a VS/Fortran program, then invoke FORTIAD. If your Fortran program is in file MYPROG FORTRAN , the commands involved might look like the following:

```
FORTVS MYPROG
FORTIAD MYPROG
```

The FORTIAD exec links the FORTIAD disk (if you have not linked it), then loads the program with the CLEAR option to clear memory, and begins execution with the DEBUG option, which causes Interactive Debug to gain control rather than your main program. You will see the following prompt appear on your screen:

```
FORTIAD
```

You can then enter commands to Interactive Debug to run the program. When the program is finished, you remain in the control of Interactive Debug, and pressing the enter key will cause the FORTIAD prompt to appear on the screen. To exit from Interactive Debug into CMS command mode, you must enter the command

```
QUIT
```

In instances where you have several binaries to be loaded into memory before you can begin execution, you can call FORTIAD as

```
FORTIAD
```

which performs setup operations for Interactive Debug, but does not load or execute anything. If you have binaries called PROG1 TEXT, PROG2 TEXT, PROG3 TEXT, and PROG4 TEXT which you wish to load together before executing, you can then enter

```
LOAD PROG1 PROG2 PROG3 PROG4 (CLEAR
START * DEBUG
```

The DEBUG option on the START command tells the system that you want Interactive Debug to gain control, instead of simply running the program. You will then receive the FORTIAD prompt on your screen and can being entering commands to Interactive Debug.

VS/Fortran Interactive Debug is described in the IBM publication *VS/FORTRAN Interactive Debug Guide and Reference*, SC26-4116. CSO has no immediate plans to stock this manual, as we hope the on-line help files may be sufficient.

ACRITH INSTALLED ON VMD (High Accuracy Arithmetic Package)

Stan Kerr

CSO has installed IBM's ACRITH package for high accuracy arithmetic. This package consists primarily of a library of Fortran-callable subroutines implementing arithmetic techniques which have been proposed by U. W. Kulisch and W. L. Miranker. There is also a macro library for those wishing to access the algorithms from assembler language, and an "on-line training component" designed to interactively introduce one to the capabilities and concepts of ACRITH.

The March 1986 issue of *SIAM Review* has a short survey article by Kulisch and Miranker on their techniques. ACRITH is described in the IBM publication *ACRITH High Accuracy Arithmetic Subroutine Library: Program Description and User's Guide*, SC33-6164-1

CSO has no immediate plans to stock this manual, though we have reference copies at the Systems Consulting Office at 1208 W. Springfield. We are preparing help files which should lessen the need for the manual.

A help file under the CSO category gives some information on ACRITH. This is accessed by entering the command

```
HELP CSO ACRITH
```

ACRITH is accessed on VMD by the command

```
LINKTO ACRITH
```

To use the subroutines of the package, one need then only compile a Fortran (or PL/I) program which calls the routines, and execute it. The LINKTO command sets up the necessary library, (which is called ACRITH3 TXTLIB).

To use the on-line training component, you need only enter

```
ACRITH
```

after first accessing the package with LINKTO ACRITH. This runs an interactive menu-driven program which allows you to select different features of ACRITH to be demonstrated. This facility is available only from a full-screen mode terminal.

The core of ACRITH is a technique for accumulating floating-point products which uses a very long accumulator of 168 bytes. This permits vector inner products to be calculated with no loss of accuracy until the final result is rounded from the accumulator into a single or double precision variable. Some computations which were previously too ill-conditioned to attempt on existing software, such as IMSL, can be performed using ACRITH.

The library contains routines for evaluation of arithmetic expressions, matrix arithmetic, solution of linear systems, matrix inversion, estimation of a real root of a polynomial, estimation of a real eigenvalue of a matrix, and high-accuracy evaluation of certain elementary functions.

VMSECURE ON VMD

Beth Engelbrecht-Wiggans

CSO is pleased to announce the installation of VMSECURE on VMD. VMSECURE is an interactive system for updating and maintaining your VM user directory. In addition VMSECURE allows for encryption and decryption of CMS files according to the National Bureau of Standards Data Encryption Standard (DES). VMSECURE subcommands will allow users to:

- Change their logon and minidisk passwords
- Change logon storage size (up to maximum for account)
- Alter the logical line editing symbols (line end, line delete, character delete and escape character).
- Select screen colors and highlighting for IBM 3279 terminals
- Monitor directory links to and from other users
- Change their account number (PS #) if they have made prior arrangements with the accounting office.
- Review their directory entry.

In addition, VMCIPHER will allow users to:

- Encrypt or Decrypt CMS files.

VMSECURE supports two systems for updating a user's directory entry; USER and MAINT. USER is a menu driven subcommand which requires a full-screen terminal. MAINT is for line oriented terminals. The user directory being modified looks something like the following.

```
USER userid   passwor  1600K 2M G
*PW= 86/04/16
*ED=
*
* User T. Name     333-0000  150 University Building
ACCOUNT acct.num dist.code
IPL CMS
CONSOLE 009 3215
LINK MAINT 190 190 RR
LINK SAS   192 192 RR
*mini disk specification
MDISK 191 3380 200 002 VM8009 WR read.pass write.pass mult.pass
```

The VMCIPHER command is used for data encryption or decryption. To use VMSECURE's USER, MAINT or VMCIPHER command first you must access VMSECURE by typing

```
LINKTO VMSECURE
```

and then use the USER, MAINT, or VMCIPHER commands as described below. (Some users and batch machines will not be allowed to use the USER or MAINT command).

VMSECURE USER	<selection <vaddr>>

where:

selection — is an optional parameter which specifies one of the nine selections available from the User Selection Menu. If no value is selected, the User Selection Menu is displayed.

vaddr — is an optional parameter which specifies an existing minidisk. The default is 191. If **vaddr** is specified, **selection** must be specified also.

Examples:

```
VMSECURE USER          *gets the User Selection Menu*
VMSECURE USER 2 191    *gets Minidisk Link Mode and Passwords Screen*
```

The Nine User Subcommand Functions:

- Selection 1: Logon Storage Size and Password

  Use Selection 1 to change your logon password.

  Use Selection I to change the amount of virtual storage your userid has at logon. The maximum storage available for your virtual machine is listed on the first line (user card) of your directory entry (last number listed). (For more information use HELP CP DEFINE and look at DEFINE STORAGE).

- Selection 2: Minidisk Link Mode and Passwords

  Use Selection 2 to modify the link mode and read, write, or multiple passwords for your minidisks. If you wish to modify the link mode and passwords for another

minidisk that you own, specify the virtual address in the FOR DEVICE field on the menu. (Use HELP CP LINK for more information.)

- Selection 3: Logical Line Editing Symbols

  Use Selection 3 to modify the terminal logical line editing symbols set for your userid at logon. The symbols that can be modified are: line end, line delete, character delete, and escape character. (Use HELP CP TERMINAL for an explanation of these symbols.)

- Selection 4: Screen Colors and Highlighting

  Use Selection 4 to modify the color and highlighting features set for your userid at logon. Color and highlighting settings only affect IBM 3279 color display terminals. (Use HELP CP SCREEN for more information.)

- Selection 5: Define a Link to Another User's Minidisk

  Use Selection 5 to set up a directory link to another user's minidisk. Directory links are performed for you at logon; you need only perform the CMS ACCESS command. To define a directory link, you must know the appropriate minidisk password for the other user's minidisk and specify a virtual address not used by your virtual machine. If the Rules facility is installed, a rule must exist that allows you to link to the other user's minidisk. The RULES facility should be installed summer 1986. (Use HELP CP LINK for more information.)

- Selection 6: Review/Remove Links By Other Users

  Use Selection 6 to review and optionally remove any directory links that other users may have defined to one of your minidisks. This selection is particularly useful when you determine that data on your minidisk should no longer be shared with other users. You should review any existing directory links to determine if any users should still have access to your minidisk. If you wish to review directory links for a minidisk other than your 191, specify that address in the FOR DEVICE field on the menu. (Use HELP CP LINK for more information.)

- Selection 7: Account Number and Distribution Code

  Use Selection 7 to change the account number to which your usage is charged or to change the distribution code (which is not used by CSO at this time). You can change your account number (PS number) only if prior arrangements have been made through the accounting office.

- Selection 8: Delete a Link to Another User's Minidisk

  Use Selection 8 to delete your directory link to another user's minidisk. In the FOR DEVICE field on the menu, you must specify the virtual address associated with the directory link you wish to remove. (Use HELP CP LINK for more information.)

- Selection 9: Review the Directory Entry

  Use Selection 9 to review all directory control statements in your directory entry. Selection 9 provides information about existing directory links and all virtual addresses

associated with your virtual machine. This information is needed for Selections 2, 5, 6, and 8.

VMSECURE MAInt	Account newacct <NEXTLOG | TEMP | IMMED> DEFine vaddr1 vaddr2 Delete vaddr <Help | ?> Link ownerid ownervaddr yourvaddr <mode> Mgrid Minidisk vaddr MDpw <vaddr> Password Review RLink vaddr SCratch vaddr STorage sizeK | sizeM Terminal keyword ON | OFF | char | hex

where:

ACCOUNT newacct <NEXTLOG | TEMP | IMMED>
: changes the account number to which your usage is charged. You can change your account number (PS number) only if prior arrangements have been made through the CSO accounting office.

DEFINE vaddr1 vaddr2
: changes the virtual address of one of your minidisks. Directory links to this minidisk are updated to reflect the new virtual address. Minidisk passwords for the minidisk remain unchanged. (Use HELP CP LINK for more information.)

DELETE vaddr
: deletes your directory link to another user's minidisk. **vaddr** specifies the virtual address of the directory link you wish to remove.

HELP | ?
: displays a brief list of the MAINT subcommand functions and their operands.

LINK ownerid ownervaddr yourvaddr <mode>
: sets up a directory link to another user's minidisk. Directory links are performed for you at logon. To define a directory link, you must know the appropriate minidisk password for the other user's minidisk and specify a virtual address not used by your virtual machine. If the Rules facility is installed, a rule must exist that allows you to link to another user's minidisk. The RULES facility should installed summer 1986. (Use HELP CP LINK for more information.)

MGRID
: determines who is your directory manager.

MINIDISK <vaddr>
: modifies the link mode and read, write, or multiple passwords for your minidisks. **vaddr** specifies the virtual address of a minidisk. (Use HELP CP LINK for more information.)

MDPW <vaddr>
: displays the passwords for your minidisks. If a virtual address is not specified, passwords for all your minidisks are displayed.

PASSWORD
: changes your logon password. VMSECURE prompts for password.

REVIEW
: reviews all directory control statements in your directory entry. The REVIEW function provides information about existing directory links and all virtual addresses associated with your userid. This information is needed for the DELETE, LINK, MINIDISK, MDPW, and RLINK functions.

RLINK vaddr
: reviews and optionally removes any directory links that other users may have defined to one of your minidisks. This function is particularly useful when you determine that data on your minidisk should no longer be shared with other users. You should review any existing directory links to determine if any users should still have access to your minidisk. You must specify the virtual address for your minidisk.

SCRATCH vaddr
: Permanently deletes one of your minidisks. When you SCRATCH a minidisk, VMSECURE automatically formats the scratched minidisk. The space occupied by the formatted minidisk is returned to the system and your files are lost. Directory links to the minidisk being scratched are automatically removed from other user's directory entries.

STORAGE sizeK | sizeM
: changes the amount of virtual storage your userid is set up with at logon. The maximum storage available for your virtual machine is listed on the first line (user card) of your directory entry (last number listed) (For more information use HELP CP DEFINE and look at DEFINE STORAGE).

TERMINAL keyword ON | OFF | char | hex
: modifies the terminal logical line editing symbols set for your userid at logon. The symbols that can be modified are: line end, line delete, character delete, and escape character. (Use HELP CP TERMINAL for more information.)

Examples:

```
vmsecure maint password
VMXSYS321R Enter your logon password:

VMXSYS372R Enter a new logon password:

VMXSYS373R Reenter your new logon password for verification:

VMXSYS317I Directory updated on-line.
R; T=0.01/0.03 10:06:39
```

VMCIPHER	fileid1 <fileid2> <(options <)>> Options: |ENcrypt| |FIle| |REPlace| |DEcrypt| |RECord|

where:

fileid1 — is the filename, filetype, and filemode of the input file for encryption or decryption. Pattern matching is not allowed.

fileid2 — is the filename, filetype, and filemode of the output (CMS disk) file to receive the results of the encryption or decryption process. **fileid2** is optional and, if not specified, defaults to the input file (**fileid1**), destroying the original contents of **fileid1**. An equal sign (=) in any field of **fileid2** indicates that it is the same as the corresponding field in **fileid1**.

Options:

ENCRYPT — indicates encryption is to be performed on the input file. This is the default value.

DECRYPT — indicates decryption is to be performed on the input file.

FILE — indicates encryption or decryption is to be performed in FILE mode. This is the default value.

RECORD — indicates encryption or decryption is to be performed in RECORD mode.

REPLACE — overrides the protection of an existing CMS file with the same file identifiers as **fileid2**. If not specified, an existing file cannot be altered. REPLACE is required when **fileid2** is specified and already exists on the minidisk.

Usage Notes:

1. DO NOT LOSE THE CIPHER KEY!!! The file cannot be decrypted without it.

2. VMCIPHER checks the console and program stacks for data. If anything other than blanks exists in either stack, that data is used as the cipher key. If both stacks are empty, the user is prompted for a cipher that is suppressed or masked on input. The key can be any character string from 1 to 40 characters in length.

3. The cipher key is used by VMSECURE exactly as entered unless there is a CMS user input translation table. (See the IBM VM/SP CMS User's Guide for further information on user input translate tables.)

4. A cipher key entered in all uppercase letters produces different output than the same key in upper and lowercase or in all lowercase.

5. Multiple encryptions can be performed on any file. To decrypt a file created by multiple encryptions, decrypt using the cipher keys in reverse order; that is, last one first.

HOW TO RUN SPSSGRAF ON VMD

Joan Mills

Release 1.1 Level 3 of SPSSGRAF, an interactive SPSS graphics product compatible with SPSSX system files, has been installed on VMD. This newest release of the product supports hard copy on our Zeta plotters. A supplement to the manual, *SPSS Graphics*, called *SPSS Graphics, Release 1.1 Update* is available at the CSO Distribution Center (1208 W. Springfield). These two manuals are scheduled to be combined into one volume in the near future.

To access the latest SPSSGRAF, enter

```
LINKTO SPSSGRAF (F
SPSSGRAF
```

(NOTE: IF you wish to plot on an IBM device rather than a Zeta plotter, use SPSSGRIB instead of SPSSGRAF.)

This version of SPSSGRAF should become the current version sometime before the fall semester. At that time, the older version will be accessed only by entering

```
LINKTO SPSSGRAF (P
SPSSGRAF
```

The following two sample procedures contain instructions for running SPSSGRAF sample graphs. The first sample procedure uses a test file that comes with the product and contains a template (i.e., instructions for labeling the graph, using various colors, changing orientation, etc.). The second sample procedure shows keyboard input to create a bar chart.

To begin, logon to VMD using a Tekronix 4105 (code number 1), an IBM 3279 (code number 4), or some other ASCII/graphics terminal (see table below for the code numbers of supported input devices). Do not use full-screen emulation (SIM or the 7171), and if you use LocalNet be sure to have ECHO ON. Type

```
LINKTO SPSSGRAF (F
SPSSGRAF
```

or, if using an IBM graphics terminal, type

```
LINKTO SPSSGRAF (F
SPSSGRIB
```

Table of Supported ASCII Devices

1	TEK4100	Tektronix 4100 Series	11	ESPRIT	Hazeltine Esprit
2	RAMTEK	Ramtek 6211	12	IBM3101	IBM 3101 (character mode)
3	VT100	Dec VT 100	13	WYSE50	Wyse 50
4	3270	IBM 3278/3279	14	VT52	Dec VT 52
5	TEK4027	Tektronix 4024/4025/4027	15	VC404	Volker-Craig VC 404
6	HP2648	Hewlett-Packard 2648A	16	VC414H	Volker-Craig VC 414H
7	IBMPC	IBM PC (w/SPSS PC Driver)	17	DATA1520	Datamedia Elite 1520A
8	HP2621	Hewlett-Packard 2621	18	HAZ1500	Hazeltine 1500
9	ADM3A	Lear-Siegler ADM-3A	19	NIH	NIH 8188
10	TVI950	Televideo 950	20	GENIE	Ann Arbor Genie

SAMPLE 1: Display a test plot stored as data and template (may change plot parameters with this setup — after step 8, you may explore EDIT options).

1. Select the ASCII device you are logged onto (if you are using a Tektronix 4105, you select number 1; if using an IBM 3279, you select number 4, etc.) Type in the code number of the device you are using, then press RETURN/ENTER to proceed.

2. From the MAIN MENU select item 8 (ASSIGN LIBRARIES). To do this, move the pointer (using the return/enter key) to item 8 and then press the PF1 (or F1) key.

3. On the ASSIGN LIBRARIES MENU move the pointer to item 2, then type TEST on the command line and press the return/enter key. Return to the MAIN MENU by pressing the PF2 key.

4. On the MAIN MENU move the pointer to item 4 for CREATE CHARTS; select by using PF1. (Note that the pointer cycles.)

5. On the CREATE CHARTS MENU the pointer will be on item 1, Specify Graphics Device. Select by using PF1. Use PF6 to go through the list and choose the appropriate graphics device (e.g., Tektronix 4105 is number 48, IBM 3279 is number 35, and our Zeta plotter is number 7 [SPSS calls it a CalComp]). Type the device number, then use PF1 for NEXT.

6. If you selected graphics device 7 above, reduce the plotting area to fit our default paper size by typing 1/7, then press the return/enter key with pointer on 1. Type 1/7 again and press the return/enter key again with the pointer on 2. This fits the drawing in a 6 x 6 square, 1 inch from the edges of the paper. Use PF1 to proceed to the CREATE CHARTS MENU.

7. On the CREATE CHARTS MENU move the pointer to 2, Select Template — select using PF1. Type TEMPTEST on the command line and press the return/enter key. The test template appears as the active template. Press PF1 to proceed.

8. The CREATE CHARTS MENU reappears, this time with the draw option (see lower right of screen). Press PF8 to draw. If a graphics terminal was previously specified, the drawing appears on the screen; if a plotter was specified (e.g., number 7), the drawing goes to a file called CALCOMP PLOTFILE A. (PLOTFILE accumulates through one program session.) If the drawing is on the screen, press return/enter to clear.

9. To exit the program, return to MAIN MENU by pressing PF2 and then type &QUIT on the command line (followed by pressing the return/enter key).

10. To complete a Zeta plot (if you entered plotter device 7 above) use NPLOT as in:

```
NPLOT CALCOMP PLOTFILE A (BIN 99 TIME 8
```

Your plot will be drawn on the plotter at CSO's Mechanical Engineering Site (65 ME Building). A plot from this sample procedure, as well as a plot from the next procedure, is shown at the end of this article.

NOTE: It may be desirable to exit the SPSSGRAF program between runs of different data because having left-over parameters set influences the path through the screens that the program selects.

SAMPLE 2: Enter raw data for bar chart (data from p. 46 of the *SPSS Graphics* manual).

1. Enter program and select ASCII device as before (see Sample 1, step 1).

2. From the MAIN MENU move the pointer to item 2, Create Data Set via Keyboard. Select with PF1.

3. On the KEYBOARD DATA ENTRY MENU type a single word name for the dataset on the command line, press return/enter. Then enter a title (no longer than the dashed line shown) and press return/enter. Item 3 is ok, data will be a table. Proceed using PF1 (do not go back to MAIN MENU or input will be lost).

4. On SUMMARY VARIABLE DEFINITION MENU type each line below, followed by return/enter on command line.

```
N/FOOD/FOOD/4.1
N/HOUSING/HOUSING/4.1
N/TRANSPRT/TRANSPRT/4.2
N/CLOTHES/CLOTHES/4.2
N/MEDICAL/MEDICAL/4.2
N/OTHER/OTHER/4.2
N/SS/SOC.SEC./4.2
N/TAXES/TAXES/4.1
```

When done press PF1. Type NO to the "associate variables" question.

5. On CATEGORY VARIABLE MENU, just proceed using PF1.

6. On KEYBOARD DATA ENTRY TABLE, type (using return/enter after each line):

```
23.0/
21.8/
9.30/7.20/
5.70/8.70/6.70/
17.5
```

Note that items may be entered more than one at a time. Values match the eight variables given in step 4. If an item is incorrect, move the pointer (using return/enter) to space in front, then type again. Use PF1 to proceed.

7. TABLE EDIT MENU allows you to go back and change the data entry. Do not return to MAIN MENU until data is saved. To save the data table, type A on command line then press PF1. Return to MAIN MENU using PF2.

8. Move the pointer to item 4 on the CREATE CHARTS MENU; select using PF1. Follow steps 5 and 6 of Sample 1 to select graphics device.

9. On returning to CREATE CHARTS MENU, choose item 4, Select Chart Type, press PF1. Pointer will be on simple bar; press PF1.

10. While still on the CREATE CHARTS MENU, choose item 5,Assign Variables, and press PF1. To have all the variables, FOOD to TAXES, used in the bar chart, type: 1 (return/enter), 2 (return/enter), etc. to 8 (return/enter). Then press PF1 to proceed.

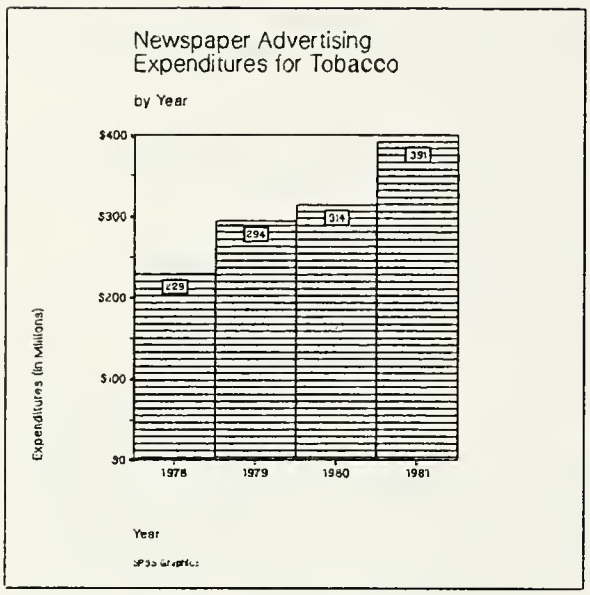
11. On the CREATE CHARTS MENU, choose Edit Template to get the title, etc. on chart — select item 6. Note the many elements of layout that may be defined in the template. Move the pointer to item 2 to create plot titles; select using PF1. Moving pointer to each position, enter a main title (one line is acceptable), a subtitle and a footnote. Use upper and lower case, or block capitals. For example:

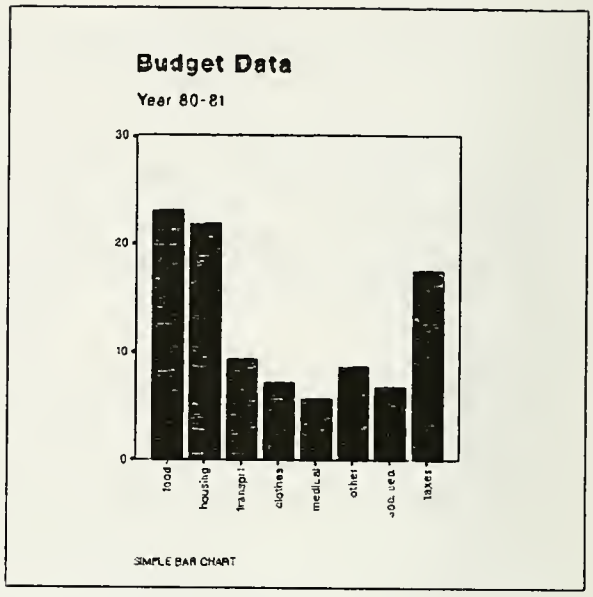
```
main: Budget Data
subtitle: Year 80-81
footnote: BAR CHART
```

12. Draw potential exists so use PF8 to draw bar chart. You may browse through the EDIT MENUs without harming the template information you have supplied (titles, etc.). However, template information is lost on exiting the program unless you save it using item 9 on MAIN MENU. Data entered in steps 4-6 will also be lost on exiting the program if it has not been saved under item 9 on MAIN MENU. When completely finished, return to MAIN MENU and type &QUIT (return/enter).

NOTE: If you selected hard copy via the Zeta plotter, be sure to NPLOT CALCOMP PLOTFILE. CALCOMP PLOTFILE accumulates through one program session, but is overwritten when the CALCOMP option is used in a later program session.

The following figures show the result of the above two sample procedures. The first figure is from Sample 1 and the second figure is from Sample 2.





Figures 1 and 2. Plots resulting from the above sample procedures.

THE ILLINOIS RESOURCE NETWORK DATABASE

Leslie Mitchell

The Illinois Resource Network (IRN) database is a powerful on-line resource that broadens contacts and communication among faculty, administrators and university departments, and with outside agencies and businesses. IRN is a textual database containing information on research and scholarship interests of over 6000 faculty members at thirteen public and private Illinois institutions. Scientific profiles will be added to IRN from Illinois' four federal research laboratories (e.g., Argonne, CERL, Fermi and USDA) in FY1987. The IRN database is written in SPIRES, a versatile database management system on the Computing Services Office's IBM 3081 computer. IRN is the only information system of its size and scope in the United States.

The IRN faculty profiles are analogous to curricula vitae in both form and content. Each faculty profile may contain the following information:

- name
- telephone number(s)
- affiliation(s)
- statement of research objectives
- interest codes (drawn from a controlled vocabulary thesaurus--the Faculty Profile Specialty Table)
- non-university employment
- international activities
- foreign language ability
- bibliography of works (publications, productions, etc.)
- mailing address
- appointments
- degree(s)
- keywords
- works reflecting current activity
- proposal review activities
- professional society offices
- public service activities
- professional awards
- significant expertise (including patents)

The Statewide System Central Office for IRN is located on the campus of the University of Illinois at Urbana-Champaign, 1205 West Oregon, Urbana (333-8770); each participating institution has its own local office.

The Campus-Wide Research Services Office (CWRSO) is responsible for maintaining IRN data for the University of Illinois Urbana-Champaign campus. Over eighty percent of the tenured and tenure-track faculty on this campus have supplied information about academic activities and interests which constitute their research and scholarship profiles.

To maintain a database that is a current reflection of the research, scholarship and teaching interests of the UIUC faculty, participants are asked annually to update their IRN profiles. In addition, profiles are added to the IRN database on a continuing basis as new faculty members join the University.

The IRN database is available to University faculty and administrators to facilitate a number of activities. Some of these activities include:

- Identifying peer reviewers in specific discipline areas.
- Assisting in the preparation of materials which document campus research activity for fund raising, budget formulation, and similar purposes.
- Helping departments, colleges, the Campus-Wide Research Services Office (CWRSO), and other offices of the Graduate College to inform researchers of particular research opportunities.
- Enabling faculty to locate others with particular areas of interest, to seek advice, to organize interdisciplinary efforts and so forth.
- Identifying faculty with particular research interests in response to inquiries from state and national businesses, the news media and other external sources.
- Assisting State and Federal Governments in locating sources of help on technical questions, locating appropriate persons for funding from government agencies, identifying appropriate persons to provide expert advice on legislative issues.

The IRN database allows a number of searching and printing capabilities. Targeted searches can be performed utilizing the code numbers from the Profile Specialty Table to search the interest code field. The glossary that constitutes the Faculty Profile Specialty Table can be accessed online. Free text searching of any field or fields of the profiles is also possible — any single or multi-term phrase may be utilized as a search key. Search keys can be ranked and differentiated by parentheses, and by both Boolean (and, or, not) and relational (greater than, less than, not equal to) operators. Up to three copies of partial (any field or fields) or complete IRN profiles may be printed on several different forms.

UIUC faculty and administrators wishing to access the IRN database should contact the Campus-Wide Research Services Office (CWRSO) at 128 Observatory, 333-0284. CWRSO research information specialists are available to conduct searches of the IRN database.

UPGRADES ANNOUNCED ON THREE MICROCOMPUTER TEXT PROCESSING PROGRAMS

Ed DeWan

PC-Write Version 2.6

Quicksoft
219 First N. #224
Seattle, WA 98109
(206-282-0452)

Version 2.6 of PC-Write, along with a completely revised manual, is now available. New features include automatic paragraph reformatting, improved on-line help, optional menus, new printers supported, embedded ruler lines, user-activated custom edit or printer control files, new and enhanced dot commands, enlarged header/footer lines (8 lines each new maximum), proportional spacing on printers that support this feature, and footnotes.

Printer support includes the HP Laserjet family. (Work is in progress on support for the Apple laser printer.) The list of supported printers is too long to include in this article; for further particulars, call 333-7318.

The program can be purchased directly from Quicksoft for $10.00. This price includes a single diskette containing all software, plus the Quick Reference and the Tutorial, which may be freely reproduced. The Reference Manual no longer comes on the disk, and must be purchased in printed form. The price is $20 for the softcover version, and $25 for the hardcover version, which includes the Tutorial and the Quick Reference. The Reference Manual is copyrighted and may not be reproduced without permission.

Manuals are also available from the vendor in quantity discount. As of April 1, 1986, the following prices are listed:

Quantity	1-4	5-49	50-499
Program diskette	10.00	5.00	4.00
Softcover	20.00	16.00	12.50
Hardcover + quickref	25.00	20.00	16.00

(Note that manual prices are scheduled to change on July 1, 1986.)

In a previous article about PC-Write (*Off-Line*, January 1986), we described the shareware concept under which PC-Write is distributed. The program may be copied freely, and the user is expected to pay for it when satisfied with the product. Registration costs $75, and procures further benefits, including full consulting support. CSO has already ordered the upgrade, and will make it available at the PC labs as soon as it arrives. The PC-Write price schedule will be revised on July 1, 1986. The major thrust of the change is a shift to recovering the cost of the software through the documentation. The prices given above for the manuals are from the April 1 price schedule, and already include an increase, which reflects this shift in policy. Further changes are in the works, but full details are not yet available.

Microsoft Word Version 3.0

Microsoft Corporation
16011 N. E. 36th St.
Box 97017
Redmond, Washington 98073
(206-882-8080)

Release 3 of Microsoft Word is now being shipped. (Currently registered users are being sent upgrade forms in the mail.) Following is a list of new features:

- Outlining — With the new outliner, the outline of your document is linked to the text, so that you can switch from one to the other at will. This facilitates rearrangement of the text.
- Table of contents and index generation — Done automatically at the option of the user. Also generates "other" tables, such as lists of figures or illustrations.
- Column support — Columns of data can be selected, and then deleted, copied, moved, reformatted, etc.
- Sorting — Text can be sorted; for example, rows of a table can be selected and then sorted alphabetically. Sorting can also be done by paragraph.
- Math — Adds, subtracts, multiplies, divides, and calculates percentage.
- Multiple columns — Can now be displayed directly on the screen, in side-by-side form.
- Hidden text — Text, such as internal comments, can be embedded in the document, and displayed at will.
- On-line tutorial — Tutorial lessons can now be accessed from within the program, thus enhancing the help system.
- Automatic numbering — Headings in outlines can be numbered automatically, and paragraphs can be numbered automatically, in different styles. When the text is rearranged, renumbering is automatic.

The following enhancements have been made:

- Line spacing is automatically set according to the largest font size within a line.
- The glossary can be printed, so as to have a list of glossary entries.
- The date and time (either file creation or print time) can be printed in the document.
- Widow/orphan control can now be switched on and off at will.
- Footnotes that do not fit on the page are automatically continued to the next page.
- If pages are separately numbered within the subdivisions of a document, you can use division number and page number to specify a range of pages to print or a page to which to jump.

- You can vary the uniform distance between preset tab stops.
- Tabbing has been corrected so that Word always jumps to the next tab stop following the last character you typed.
- There is now support for printers that have a third bin (usually for printing envelopes).
- Word now uses the 640x400 high-resolution graphics mode on IBM PC-compatibles made by AT&T and Xerox, and on the Hewlett-Packard Vectra. Also, on an Enhanced Color Display with the Enhanced Graphics Adapter, you can request a display of 43 lines rather than 25 lines.

The price for the program new is currently $450, and current users can upgrade for $75. (If you purchased the program since March 1, 1986, the upgrade is free.) CSO has several copies of this program at the PC labs, and the upgraded packages will be announced when they become available.

Volkswriter Deluxe Version 3.0

Lifetree Software
411 Pacific Street, Suite 315
Monterey, California 93940
(408-373-4718)

(Except for the last paragraph, the following information is taken from John Lombardi's review in *Infoworld*, December 23, 1985, p37.)

Version 3.0 of Volkswriter Deluxe is now available. New features include a spelling dictionary, math functions, sorting, format files, optional automatic paragraph reformatting, multiple spacing optionally displayed on screen, text merge, IBM Enhanced Graphics Adapter support for up to 43 lines of text per screen, automatic hyphenation, style sheets and embedded formats stored with the document, a new layout function for rapid change from one layout to another within a document, exit to DOS, conversion to and from IBM Document Content Architecture, Wordstar 3.3, and ASCII formats.

Version 3 does not have footnoting or windows, and there is still no undo command. However, it does run under Top View, and with programs such as Sidekick. It is much larger than earlier versions, and requires a minimum of 256K of RAM; more is recommended for better performance. The size also results in some inconvenience when operating on a two-floppy system, since then the program must be loaded in two stages from separate disks. Performance, however, is judged to be adequate even in this restricted circumstance.

The question of networking is somewhat vague. A call to Lifetree elicited the following information: Version 3 will run under "many" popular networks, particularly those supported by IBM equipment. However, if different users on the network are to access the software on a common machine, separate copies must be maintained on separate directories for this purpose — the same copy cannot be accessed simultaneously by more than one user. Work is in progress on a true networking version, which is expected to be completed in approximately six months. Site licensing terms are available. For further particulars, call the Lifetree sales department.

THE UIUC CMS USERS GROUP — AN UPDATE

Greg Kesner

In early April, an organizational meeting of the UIUC CMS Users Group was held. At that time, a call was made for volunteers to serve on a Steering Committee that would help guide the development of the users group. There were some volunteers from those in attendance, but we would like to have a few more people on the Steering Committee from a variety of departments and/or CMS applications on the campus. If you would be willing to serve your colleagues in this way, please contact Greg Kesner (CMS Userid: KESNER AT UIUCVME) for more details. We hope to have our first Steering Committee meeting in early May and then have a general session of the users group in early June.

The creation of a CMS Users Group Members Database was also announced. The database will serve as a contacts list and a mailing list for information on activities of the users group and other CMS information provided by members. If you would like to have your name added to the members database, you may use the CMSUSER command on any of the IBM machines. Simply enter the command:

```
CMSUSER
```

The command places you into XEDIT on a file of information fields which you are asked to complete. When you have finished entering your data, you may enter the FILE command to have the information file sent to the database coordinator. You may also use the CMSUSER command whenever you need to update your information in the database. We plan to make the database into a CMS NAMES file which could be accessed by any local CMS user to facilitate communication among CMS users. You are encouraged to have your name entered into the database and to become involved in the users group.

A functional framework for the users group was also discussed at the organizational meeting. We plan to form special-interest committees to explore various issues relating to CMS usage, such as PC-to-mainframe CMS applications, general issues involving networking to CMS, useful CMS execs and XEDIT macros, national and international electronic mail facilities, and CMS graphics applications, to name a few. We also plan to have monthly seminars on topics suggested by the committees, individual members, or new developments in CMS features and services. Our local IBM representative has also offered to periodically arrange some presentations by IBM representatives. We also discussed the possibilities of the interest groups meeting monthly for informal luncheon discussions. In short, we expect interesting, informative, and enjoyable opportunities in the months ahead.

As you may have guessed, we are excited about the potential in the UIUC CMS Users Group. We hope you will join us!

NEW PC DEMO ROOM

Robert Penka

CSO is equipping a microcomputer showroom which members of the university community can use to preview hardware and software before purchase.

The showroom will serve two purposes. First, it will allow participants in the IBM project EXCEL to preview hardware and software, enabling them to then make informed requests for awards of equipment. Second, we hope to meet the larger needs of the campus in general by approaching other vendors with requests for donations or loans of equipment. The primary focus here will be on equipment that is not otherwise readily available for inspection.

At the present time the room contains an IBM RT PC, a PC/AT equipped with a professional graphics display, a PC/AT model 339 (8 MHz, enhanced keyboard), an Apple Macintosh (512K), and an Apple LaserWriter. We also have stocked an assortment of IBM software and technical documentation. An IBM Pageprinter will be installed as soon as it arrives. If you have suggestions about other equipment which should be made available, please let us know.

The showroom is located in room 117 CSO Office Building. This building is located at 101 S. Gregory, Urbana (1/2 block south and 1/2 block east of the Astronomy Building). For the present, the showroom will be open 9 am - Noon, Monday through Friday.

As use of the facility grows, the hours of availability will be expanded and a student attendant will be on duty at all times. For the present, contact Jack Knott (333-6562) to make arrangements to use the room during the scheduled hours of operation. Jack is managing the showroom, and suggestions and/or questions about the equipment should be directed to him.

OFF-LINE's Mailing List

If you wish to be placed on our mailing list for future issues of *OFF-LINE*, if you wish to be removed from the list, or if you wish to enter an address correction, please complete and return this page. **(Current subscribers are kept on the mailing list until a specific request for removal is received, or until a mailing is returned as undeliverable.)**

Check one:
- ☐ Place my name on mailing list
- ☐ Make the following corrections or changes
- ☐ Delete my name from mailing list

_____

First name -- Initial -- Last Name

Campus Address:

_____

department

_____

Room - Building

Off-campus Address:

_____

Organization or Company (if applicable)

_____

Street Address

_____

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150 Digital Computer Laboratory
University of Illinois at Urbana-Champaign
1304 West Springfield Avenue
Urbana, Illinois 61801

CSO SITES

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14 Digital Computer Lab 333-7685	Monday-Saturday, 24 hours/day Sunday, 12 noon - 12 midnight
CSO SOUTH	
70 Commerce West 333-4500	Monday-Saturday, 8 am - 12 mid. Sunday, 12 noon - 12 midnight
AGRICULTURE	
N-120 Turner Hall 333-8170	Monday-Thursday, 8 am - 10 pm Friday, 8 am - 5 pm Saturday-Sunday, Closed
CHEMISTRY	
150-154 Noyes Lab 333-1728	Monday-Friday, 9 am - 5 pm Saturday-Sunday, Closed
CRH SNACK BAR	
120 Snack Bar 333-1851	Daily, 12 noon - 12 midnight
ELECTRICAL ENGINEERING	
146 Electrical Engineering 333-4936	Monday-Friday, 8 am - 12 mid. Saturday, 8 am - 5 pm Sunday, Closed
FAR	
Florida Avenue Residence Halls 333-2695	Daily, 12 noon - 12 midnight
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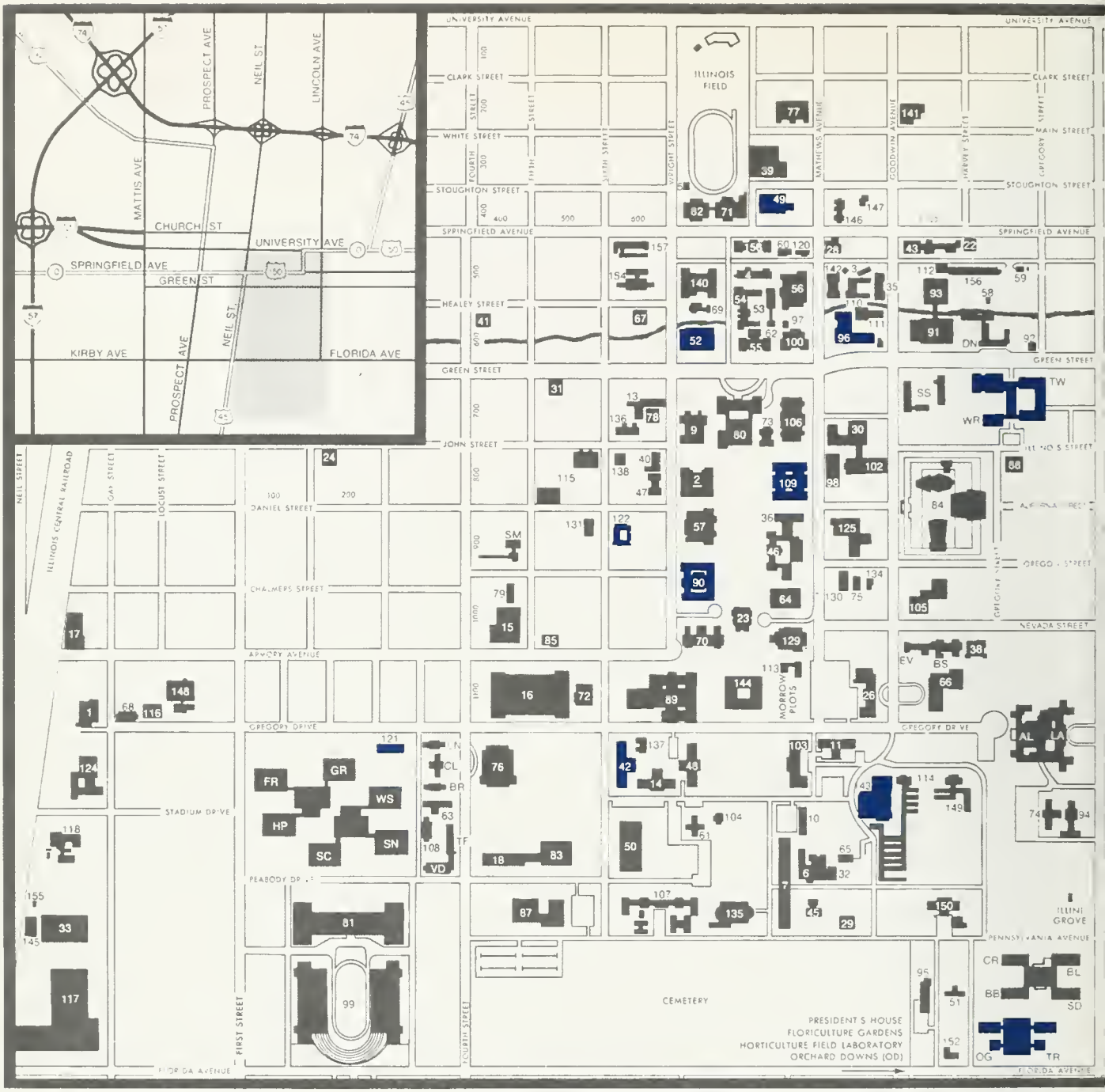
Illinois Street Residence Halls 333-0307	Daily, 12 noon - 12 midnight
MECHANICAL ENGINEERING	
65 Mechanical Engineering 333-1430	Monday-Saturday, 8 am - 12 mid. Sunday, 12 noon - 12 midnight
PSYCHOLOGY	
453 Psychology 333-7815	Monday-Friday, 8 am - 5 pm Saturday-Sunday, Closed
SOCIAL SCIENCE	
202 Lincoln Hall 333-0309	Monday-Friday, 8 am - 12 mid. Saturday, 10 am - 5 pm Sunday, 12 noon - 5 pm



42 Commerce West
49 Digital Computer Lab
52 Electrical Engineering
90 Lincoln Hall
96 Mechanical Engineering
109 Chemistry - Noyes Lab
121 CRH Snack Bar
122 Psychology
143 Agriculture - Turner Hall
Illinois Street Residence Halls
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off line

iversity of Illinois at Urbana-Champaign

rector: George Badger
itor: Lynn Bilger

mputing Services Office

CSO DIRECTORY

USER SERVICES AND HARDWARE/SOFTWARE SUPPORT

User Accounting	**1208**	**W Springfield**	**333-7752**
Documentation Center	**1208**	**W Springfield**	**333-9230**
Systems Consulting	**1208**	**W Springfield**	**333-6133**
Statistical Services Consulting	**85**	**Comm West**	**333-2170**
PC Consulting	**91**	**Comm West**	**244-0608**
Text Processing Consulting	**212**	**CSOB***	**333-7318**
Maintenace & Repair Service	**194**	**DCL**	**333-0969**
Tape Service, Special Plots, Xerox Laser Printer	**123**	**DCL**	**333-8640**

DIAL-UP NUMBERS

CYBER 175 (NOSA)	**300**	**baud**	**333-4000**
CYBER 174 (NOSB)	**300**	**baud**	**333-4004**
IBM 3081 GX (VMD)	**300**	**baud**	**333-4006**
Switch	**1200**	**baud**	**333-4008**
TELENET (local no.)			**384-6428**

CSO STAFF

Director	George Badger	150	DCL	333-4103
Business Manager	Stanley Rankin	150	DCL	333-6530
Secretary	Joyce McCabe	150	DCL	333-1637
Networking	Sue Greenberg	187	DCL	333-3723
Systems & User Services	Ahmed Kassem	185	DCL	333-7159
Hardware Maintenance & Communication	Mike Gardner	173	DCL	244-0914
Personal Computers/EXCEL	Robert Penka	119	CSOB*	333-4709
Supercomputer Activities	Sandra Moy	1207	W Springfield	333-9772
Maintenance	Larry Crotser	131C	DCL	333-5190
Consulting	Stan Kerr	208	CSOB*	333-4715
Statistical Services	Joan Alster	202	CSOB*	244-0937
Accounting Services	Gary Bouck	1208	W Springfield	333-7752
Microcomputer Laboratory	Jack Knott	102	CSOB*	333-6562
User Training (Short Courses, Videotapes)	Ron Szoke	108	CSOB*	333-8630
Documentation	Lynn Bilger	207	CSOB*	333-6236
CYBER-IBM-VAX Operations	Myra Williams	168	DCL	244-0186
Site Operations	Sylvia Hansen	65	ME	333-6285

*CSOB is the new CSO Office Building, 101 S. Gregory, Urbana.

Academic and research computing is done on the following machines: CDC Cyber 175 running NOS 1; CDC Cyber 174 running NOS 2; IBM 3081 running VM; IBM 4341 running VM; VAX 11/780 running UNIX and driving a GSI CAT-8 phototypesetter; three Pyramids and a Sequent running UNIX. In addition CSO serves as Facility Manager for various departmental machines (e.g., other IBMs) and for the National Center for Supercomputing Application's CRAY X-MP.

Operating Hours (see HEARYE,SCHEDUL for exceptions):

	CYBER 174/175	IBM
M-F	8 am - 6 am	8 am - 6 am
SAT	8 am - Midnight	8 am - 6 am
SUN	Noon - 6 am	Noon - 6 am

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OFF-LINE is the monthly newsletter of the Computing Services Office at the University of Illinois, Urbana-Champaign. Unless otherwise indicated, permission to reprint is freely granted, provided that the author, if named, and the Computing Services Office (CSO) are credited. Mention of manufacturer and trade names in this newsletter does not imply endorsement. Information in this issue is current as of June 2, 1986. Articles, suggestions, comments and/or subscription requests may be sent to: Lynn Bilger, Off-Line Editor, 150 Digital Computer Lab, University of Illinois, 1304 W. Springfield, Urbana, IL 61801.

THE IBM 3800 PRINTER

Allan Tuchman

An IBM 3800 Model 3 printer has been installed in room 16 DCL. It is a high-speed, general purpose, non-impact printer that uses electrophotographic and laser technology. The printer can achieve speeds as high as 19,350 lines per minute, printing up to 215 full text pages per minute. Text is printed at 240 dots per inch, yielding excellent output.

The 3800 printer is ideal for both high-volume and high-quality print output. In the near future, the 3800 will replace the PPS printer currently used for very large print jobs.

Printer Data Formats

Although the 3800 printer accepts data in two formats, line mode and page mode, only the line mode is currently available to users. Standard print files are in line mode format.

Vertical spacing is variable, depending on the page formatting option selected. Different character fonts provide for 10, 12, 15, or more characters per inch horizontally. All text printed in line mode uses uniformly spaced characters.

Printer Forms

The 3800 printer uses paper 11 inches wide by 8 1/2 inches high, a bit smaller than the other standard printer forms. The sheets are perforated at the edges, so the "burst strips" with the sprocket holes can be torn off easily. The printing area within each sheet is 10 inches horizontally by 7 1/2 inches vertically, leaving about a 1/2 inch margin on all sides.

The PAGEDEF: Line Mode Formatting

PAGEDEF is the term used for a group of pre-set parameters that specify how a page is to be printed. PAGEDEF names are limited by the operating system to four letters and digits. The default PAGEDEF is named STAN and will print 60 lines of up to 133 characters per page.

Normally, print runs across a page from left to right (e.g., across the 12 inch width). The 3800 printer allows text to be printed DOWN the page with rotated characters (e.g., will print "across" the 8 1/2 width). Using PAGEDEFs that define a downward direction (e.g., LR60, LR66, LR80, LDR0), you can print in a typewriter-like format. This is especially useful for documentation, papers, theses, and other prose.

Many PAGEDEFs work well with only a single font, especially those requiring small characters. These PAGEDEFs have the font explicitly coded into them, offering the user no choice. These PAGEDEFs are marked with an asterisk in the font column of the table shown below.

Some PAGEDEFs work well with several fonts. A larger font may be more readable, but a smaller font will allow more characters per line. In this case the one or two suggested fonts are listed in the Font column in the table. It is the user's responsibility to specify the font he wants to use.

Be warned, however, that if a font larger than the recommended font is selected, lines may overlap, lines near the top or bottom of the page may not print, or characters may extend off the right or bottom edges of the page. In many of these cases, no warning or error message will be issued; it is the user's responsibility to select the correct size font.

Other PAGEDEFs may be requested. The most useful PAGEDEFs supported for 3800 printing on standard forms are as follows:

Forms name: STAN

PAGEDEFs for 12" wide by 8 1/2" high forms
printable area 11" x 7 1/2"

PAGEDEF Name	Line per Page	Chars per Line	Lines per Inch	Direction	Multiple Up[1]	Font	Comments
STAN	60	132	8.45	across		D225*	default
LR60	60	73	6	down		GT10	
LR66	66	73/85	6.6	down		GT10/GT12	
LR80	80	85	8	down		GT12	
LDR0	60	142	12.5	down	2	GT20*	
LS66	66	132	9	across		D225*	

[1]Multiple-up refers to the number of logical page images printed per physical page. Two or more pages may be printed at a reduced size on each sheet of paper.

*If the font name is marked with an asterisk, this font is "built-in" to the PAGEDEF and cannot be changed. It is the only choice.

The fonts named in the above table are:

GT10 Gothic Text 10-pitch. This font prints at 10 characters per inch horizontally.

GT12 Gothic Text 12-pitch. This font prints at 12 characters per inch horizontally.

GT20 Gothic Text 20-pitch. This font prints at 20 characters per inch horizontally.

D225 Data1 Roman. Used for 8 lines per inch PAGEDEFs. This font prints at 13.3 characters per inch horizontally. The font allows 133 characters to be printed in 10 inches.

Commands for Printing on the 3800

For line printing from the Cyber or IBM, the concepts are the same, but the syntax and parameter names are slightly different. The usual print parameters such as BIN and CC apply and are not discussed here. The three relevant parameters are:

- DESTINATION — 3800 is the destination value for this printer. This parameter is specified as DEST on both the Cyber and IBM command.
- PAGEDEF — The default is STAN, but may be overridden by using one of the other PAGEDEFs in the above table. This parameter is specified as PAGEDEF on the Cyber, but as PDEF on the IBM command.
- FONT — The default is D225, but may be overridden by specifying another font such as GT10 (see above table). This parameter is specified as FONT on the Cyber, but as CHARS on the IBM command.

The syntax for the IBM and the Cyber commands is as follows:

IBM

NPRINT fn ft fm (DEST 3800 PDEF pagedef CHARS font

Note that the term PDEF must be used instead of PAGEDEF, and the term CHARS must be used instead of FONT in the IBM command.

Cyber

PRINT,file/DEST=3800/PAGEDEF=pagedef/FONT=font.

A listing produced on the 3800 will have a somewhat different burst page; however, the listing will still be identifiable by the bin number and the userid or user number.

Error Messages

The software that actually drives the 3800 printer is the Print Services Facility (PSF). Certain errors are detected only at print time. The most common example of such an error is printing a line that will extend off the right edge of the page (of bottom of a rotated page). Another error message could be about a paper jam with the subsequent reprinting of a page.

In any case. PSF will issue a message describing the problem. PSF errors are usually printed in a separate dataset at the end of a user's job, but may print in the midst of a job. A recovery from a paper jam (that may result in some pages printing twice) may have the PSF message printed in-line (on a separate page) at the point the pages were duplicated.

A copy of the PSF messages manual is available at the Consulting Offices, to help diagnose problems. Some problems, like "page too complex" or "not enough font storage in the printer" simply cannot be solved, only explained. They reflect hardware limitations. However, such unsolvable problems should not occur during line mode printing.

Future Capabilities

In the near future, the 3800 will be able to support a higher quality printing of text with fully proportional spacing. The printer will also plot Zeta plot files and DI-3000 metafiles — far faster then the Zeta plotters and with fairly high-quality output. A future *Off-Line* article will announce these services.

INFORMATION ABOUT THE DIFFERENT TYPES OF CSO ACCOUNTS

Merlin J. Foster

CSO's facilities and services are available to anyone engaged in work sponsored by the University or a state agency. Many departments have appointed a member of their faculty as "Computer Coordinator." If one exists in your department, you should contact this coordinator about your computing needs before contacting CSO.

Various types of funding are available for computer work. Since many of our users do not really understand the different types of funding or which type is appropriate for their particular needs, we felt that an article on this subject would be helpful.

The types of funding that are accepted by CSO are:

I. Class
II. Research Board
III. Bulk
IV. Grants and Contracts
V. Invoice — Personal and/or non-University

Since two common terms, Account number and PS number, are used throughout the following discussions of types of funding, we will explain them briefly first.

- **Account number**: This is the University account number (11 digits) that is provided to departments by the University Accounting Division for Contract, Grant and State funds. For any new account using these types of funds, an Account Information Form must be submitted to CSO's Accounting Office, 1208 W. Springfield. Since Class and Research Board accounts are handled through CSO, no Account Information Form is required for these types of accounts.

- **PS number**: This number is a four-digit number generated by the CSO accounting system that is used for billing CSO charges.

Information regarding the Account Information Form, or questions about accounts and PS numbers can be obtained at the CSO Accounting Office, 1208 W. Springfield, Urbana.

I. Class

The Committee on Instructional Computer Usage (CICU) allocates, through CSO, funds for those departments that offer courses which:

- Require the use of CSO computers as an integral part of the course;

- Allow students to use CSO computers as an adjunct to courses being offered; or

- Are not 499 courses (these courses are funded through the Research Board).

Class allocations are provided for the Spring, Summer, and Fall Sessions. CICU notifies each department (with prior class usage history) of its allocation on the following schedule:

Spring — December
Summer and Fall — May

PS numbers assigned to classes expire at the end of the semester according to the schedule:

Fall — January 5
Spring — June 12
Summer — August 21

Instructors with questions regarding class funding should talk to the "Computer Coordinator" of their department. If further information is needed, please call Merlin J. Foster, 189 DCL (333-6618).

All Class accounts are monitored. Any number of PS numbers may be assigned to a departmental class account; however, when this monitoring shows that total usage for class PS numbers is exceeding the amount of funding for that account, all PS numbers attached to the

account are inactivated until such time as additional funds are authorized by CICU to be placed into the account.

Students currently registered at the University may avail themselves of the "Free Student Account" by presenting their Student ID to the CSO Accounting Office (1208 W. Springfield). This Free Student Account provides a student with a limited amount of funds that may be used to learn about CSO's computing systems.

II. Research Board

The Research Board allocation periods extend from late December through late June, and late June through late December. The Research Board notifies each department of its allocation for each of these periods in November and May, respectively.

Allocations from the Research Board are made to the department. The department, in turn, is responsible for proper distribution of the allocation to their faculty members.

Research Board funds are allocated for the furtherance of University research. It is hoped that most Research Board funds will be used for "seed monies" to attract outside grants and contracts. Research Board funds are also used to provide computer access to those graduate students, under appropriate faculty guidance, who are taking 499 courses for thesis work.

If you are a faculty member and do not have access to CSO's computers through a Research Board account, you may be eligible for a SARA (Small Annual Recurring Allocation) account. A SARA account provides access to a limited amount of computing and can be obtained by simply requesting it and showing your staff ID at the CSO Accounting Office (1208 W. Springfield, Urbana).

It needs to be stressed that the primary purpose of Research Board funds is to attract grants and contracts from outside the University. CSO depends upon outside sources of financing for a portion of its budget. Therefore, there are times that additional Research Board allocations (supplemental allocations not provided within the normal allocation process) may be provided with the requirement that the receiving department pay for a portion of that additional allocation with departmental funds.

All Research Board accounts are monitored. Any number of PS numbers may be assigned to a Departmental Research Account. However, when this monitoring shows that total usage for all PS numbers is exceeding the amount of funding, all PS numbers are inactivated until such time as the Research Board approves additional funds to be placed into the account.

Questions regarding the allocation procedure for Research Board funds should be addressed to the following persons, in the order listed:

- Departmental Computer Coordinator
- Merlin J. Foster (333-6618)
- Dean S. Wasserman, Graduate College (333-2640)

III. Cyber Bulk

In general, Cyber Bulk jobs are those jobs that:

- Require large amounts of computer time (at least 20 CPU hours);
- Do not require tape mounts;
- Can be run with a minimum of operator intervention; and
- Can be run during low activity time on the computers (i.e., no guaranteed turnaround).

Applications for bulk time on the Cyber are processed through the Research Board, which submits the request for peer review by other faculty members. (NOTE: Bulk accounts apply only to the Cyber, **not** the IBM.)

Cyber bulk jobs are billed at 15% of the normal job rate. The cost for a Cyber bulk job is not reflected by a reduction in the Departmental Research Board account. Rather, the charge is made at the end of the month when the UFAS voucher tape is generated by the CSO accounting system.

IV. Grants and Contracts

Faculty members who have outside funding can apply for PS numbers through the CSO Accounting Office (1208 W. Springfield). This pre-supposes that the account(s) to which the PS number is to be charged is a University generated account and is recognized by the University's Accounting Office. The Principal Investigator named in the grant or contract can choose to have his account monitored by the CSO accounting system. If one so chooses, all PS numbers assigned to that account will be inactivated once this monitoring shows that total usage of PS numbers is exceeding the monitoring amount indicated on the Account Information Form.

V. Invoice — Personal or non-University

An Invoice Account is available to those who do not have University funding as outlined in I through IV above.

It is possible to gain access to CSO computers by applying for an Invoice Account at the CSO Accounting Office (1208 W. Springfield). The charges for such an account can vary from 100% or regular University rates to 175%. For more details, contact Gary Bouck (333-7752).

SAS FOR THE IBM-PC

Vicky Dingler

SAS Institute has recently distributed SAS Version 6 for the IBM personal computer. There are two products currently available: BASE and STATS. The SAS Base product for the PC includes the procedures available in the mainframe version. Additional procedures are available that allow the PC windowing facility to be used to its full extent, as well as mainframe interfacing facilities. SAS STAT for the PC includes several of the statistical procedures available for the mainframe. Included in the list are: GLM, REG, ANOVA, DISCRIM, FACTOR, NPAR1WAY, SCORE, TTEST, RSQUARE, STEPWISE, FREQ, CANCORR, CATMOD and ORTHOREG. Additional procedures will be forthcoming.

SAS/RTERM will be available within three months. It is a terminal emulation facility that allows the IBM PC to emulate the Digital Equipment Corporation VT100 terminal for text and the Tektronix 4105 terminal for graphics output. Here at the University of Illinois, it can be used with a 1200 baud Switch port or a 9600 baud LocalNet port with the IBM 7171 to allow full screen text editing to emulate a DEC VT100 terminal. It can also be used with the Switch or LocalNet to emulate a Tektronix 4105 graphics terminal for using SAS/GRAPH on the mainframe to generate graphics.

SAS IML for the PC will be available by the end of this year. It is an interactive data manipulation language that operates on entire matrices of values.

SAS Version 6 for the IBM XT and IBM AT is called PC DOS SAS and requires at least 10 megabytes of hard disk storage. The IBM PC DOS operating system that is required is release 2.0 or later. The machines that are supported are the IBM PC AT, PC XT and the 3270 PC. There is a minimum of 512K real memory required for all three machines. The control program required for the 3270 PC is release 1.21 or 1.22 only. The control program will consume about 200K of the available 640K in PC DOS. Since SAS requires at least 512K, the control program should be reconfigured to support only one mainframe session and the PC DOS session.

Version 6 will be installed from diskettes onto the hard disk. The SAS BASE and STAT products will each use at lease 3 megabytes of hard disk storage. The other products will use at least 1 megabyte each. Hence, 10 megabytes of hard disk will be inadequate if all of the SAS products are needed.

CSO has purchased the licenses for these SAS PC products. There will be an initial fee for each product as well as a yearly renewal fee for each product.

SAS PC DISTRIBUTION

Vicky Dingler

In keeping with the license agreement the University of Illinois has entered with SAS Institute, a license agreement between the University and the user has been developed that meets various criteria. The license agreement will have the stipulations for compliance. It will also have a form to be filled out with questions pertaining to hardware specifications and its location. The license agreement can be obtained at 1208 W. Springfield or 85 Commerce West. The completed license agreement will be sent or brought to the person(s) managing SAS PC distribution at Central Stores. A photocopy can be made for personal files.

The license agreement will serve several purposes. First, it will be a means by which the University can uphold the stipulations in the license agreement between itself and SAS Institute. Second, it aids Central Stores in keeping accurate records. Third, the information will be added to the SAS PC User's Mailing List. The SAS PC products can be purchased at Central Stores located at 1609 South Oak Street.

The Base product is 14 diskettes and costs $63.80. The Stat product is 7 diskettes and costs $40.50. Although RTERM will not be available for three months, an order can be placed for it. These prices include the yearly license fee, and the price of the diskettes. The license fee includes free updates. If there are updates for this version, the cost will include the price of

the diskettes. The license will be renewed between SAS and the University each year, as will the license between the University and the user.

Those entitled to buy the product are those who are employees of the University. A valid staff ID card will suffice as proper identification if you chose to visit Central Stores. A purchase order with the following stock numbers can be sent to Central Stores for ordering the SAS products and documentation.

STOCK #	PRODUCT	PRICE
19806300	SAS BASE License Fee	$27.50
19806350	SAS BASE Diskette Fee	$36.30
19806400	SAS STAT License Fee	$22.00
19806450	SAS STAT Diskette Fee	$18.50
19806500	SAS RTERM License Fee	$16.50
19806550	SAS RTERM Diskette Fee	$ 2.75
19806600	SAS Intro. Guide for Personal Computers	$13.15
19806610	SAS Language Guide for Personal Computers	$16.45
19806620	SAS Procedures Guide for Personal Computers	$16.45
19806630	Technical Report P-144: Writing Rlink Files	$ 4.50
19806640	SAS/STAT Guide for Personal Computers	$16.45
19806650	Technical Report P-161: Additional Stat Proc.	$ 5.00
19806660	SAS/RTERM User's Guide	$ 9.85

The manuals for SAS PC can also be purchased at 1208 W. Springfield.

SAS PC CONSULTING

Vicky Dingler

The members of the CSO Statistical Consulting Group will have the ability to consult on SAS programming techniques and statistical procedures. They will know how to install SAS on the PC and be able to consult on this technique. They will consult on the uploading and downloading procedures provided by SAS. Any and all consulting responsibilities lie with the CSO Statistical Consulting Group. Their office is in 85 Commerce West. The hours for this office are 9 - 1 Monday and Wednesday, 9 - 5 Tuesday and Thursday, and 9 - 11:45, 1:15 - 5 on Friday. Their telephone number is 333-2170.

Vicky Dingler will take ultimate responsibility for all issues concerning SAS or the PC. These issues include: licensing, copying, distribution, installation, consulting, use, training and any other issue. All questions and/or problems can be referred to her (333-4668).

NOTEBOOK II AND BIBLIOGRAPHY

Tools for Text Storage, Retrieval, and Organization

Edmund DeWan

CSO, in conjunction with the School of Life Sciences, the Psychology Department, and the Chancellor's Office, has entered into a purchase agreement with Pro-Tem Software to distribute the programs Notebook II and Bibliography. The package, which includes two program diskettes and a paperback manual, sells for $25 at the CSO Distribution Center. (The current list price for Notebook II/Bibliography is $264.)

The Notebook package can be purchased by faculty, staff, or students. Under the terms of the agreement, consulting support is provided through the Text Processing Consulting Office, 333-7318. Upgrades will be available free for a period of two years, until April 1988.

Notebook II and Bibliography comprise a powerful set of tools for many different text management applications. They are especially useful for handling research notes, for generating bibliographies from textual data bases, and for cross-referencing manuscripts. They can also be used for mailing lists, personnel files, medical records, inventories, recipes, and many other tasks.

Notebook

A Sample Record

To give the reader an idea of how Notebook works, here is a record from the sample BOOKS database that comes with the program:

```
==========================================
Keyname      |Thomas, 1974
Author       |Thomas, Lewis
Title        |The Lives of a Cell: Notes of a Biology Watcher
Publisher    |New York: Viking Press
Date         |1974
Categories   |essays, natural science, biology, philosophy
Comments     |Short essays on the organization and
             |interdependence of life forms, at the cellular
             |level and otherwise...
==========================================
```

When this record is displayed, the bottom of the screen shows the following message:

```
================
books     1/22   99% left
================
```

This means that you are looking at record 1 out of a total of 22 records in the database, and that record 1 is only 1% full, i.e., there is 99% of the available space left for record 1. Notebook allows up to 28,000 characters in each record.

Record Fields

In the sample database, there are seven fields — *Keyname, Author, Title, Publisher, Date, Categories*, and *Comments*. The first field, Keyname, has been included for use with the Bibliography program. (Bibliography requires that the first field of each record contain the keyname by which you will refer to the work.)

The vertical bars in the display are called the "margin line," and serve to separate the field headings from the text of the fields. Its position can be adjusted up to column 22, to give a maximum of 20 characters for the size of the field name. This leaves a minimum of 54 characters for each text line in the field. (The margin line need not appear in printed versions of the database, since print formats are at the discretion of the user.)

> *Note: There are no subfields in Notebook. However, you can usually create a separate field containing the necessary information, and get the desired results using the Selection rules.*

Moving About

Moving within a record is a simple matter of using the cursor keys, plus other cursor-moving controls. To move from one record to another, you simply press the PgDn or the PgUp keys. You can jump to the beginning or end of the database, and you can jump to any record by number.

Context Searching

You can search upwards or downwards through the database for text strings that occur either at the start of any field, or anywhere within a field.

Entering New Text

When you enter text into a field, word wrap is in effect, so you just go ahead and type. You can use the Enter key at any time to start a new paragraph in any field. Also, you can use the Enter key to add new text to any field within any record. Fields and records grow dynamically as you add text. You have a choice of Indent or Overtype mode, which can be set as default, or toggled with the Insert key.

Modifying Records

You can delete and modify existing text in fields, "undo" an entire set of changes to a record, add new records, and mark records as deleted/undeleted.

Records that are marked as deleted can be made invisible or visible, but they remain in the database until you compact it, at which time they are discarded. Any record that is marked deleted can be "un-deleted" at will, until you compact the database.

Also, you can copy any record to the end of the database, where it becomes a new record to be modified. This enables you to have several records based on a common set of data.

Creating, Reordering, and Merging Databases

When you create a new database, you establish the names and order of the fields (up to a maximum of 50). The simplest way to do this is to call notebook with the new name, like this:

New fields can be added, either when first creating a database, or in an existing one, and the entire order of the fields can be changed at any time using the Restructure menu in the Utilities module.

Two databases having the same structure can be merged, which allows you to combine databases into new databases. This technique can also be used to make a copy of an old database under a new name; just create the new one, and merge the old one into it.

View Selection

One of Notebook's most important and useful features it its ability to Select records according to various criteria, and assemble the selected records into "views", which can then be printed, saved to a file, or made into new data bases. (A view is just a set of pointers into the main database, and takes up relatively little space on the disk.) Note that **all views are discarded** when you **compact or reorganize** the main database.

Selection rules include *Contains, Excludes, Begins with, NOT Begins with, Less than, Less than or equals, Greater than, Greater than or equals, OR*, and *AND*. Stated more simply, this means that you can sort any view (including the main database, thinking of it as a view), either alphabetically or numerically, in ascending or descending order, based on any field. Furthermore, it means that you can extract a subset of any view, to create a new view, based on any field.

Once a view is created, it can be further narrowed by applying a new selection to it, or it can be broadened by merging two or more views. A view can be used to create a new, independent data base. By using the extended selection process (selecting on one field with one set of criteria, and then on another field with another set of criteria), you can create views based on the content of more than one field at a time. Records can also be sorted alphabetically or numerically based on the text at the start of any field.

After you have created a view, based on selection criteria, you may find that your selection either contains some records you didn't want, or there are some records you want to include that didn't get caught in the selection process. You can add records to a view from the main database, or subtract records from a view. Also, you can change views, merge views, delete all records in a view, un-delete records in a view, and remove a view from the disk, i.e., delete the entire view.

Report Editor

Notebook contains a report editor that allows the user to extract information from any view, including the main database, and print it in different formats. Selected fields can be printed, and formats can be defined by the user. All the rules for record modification apply while in a view, and the modifications are made in the main database, since a view is a set of pointers into the main database.

Saving Your Work, and Backup Copies

One point not explicitly made yet is that Notebook consists of three main modules, driven by a command program. The modules are *Edit, Print*, and *Utilities*. The View menu resides in the Edit module, so manipulating views is fast and simple. Whenever you leave the *Edit* module, all work done is saved. Furthermore, you can save all work done with the Write option, while in the *Edit* module.

One slightly unusual aspect of this is that Notebook takes every opportunity to save your work to disk, even if you don't want it to. Since most word processors allow you to abandon an edit without saving the changes, this feature may take some getting used to.

For example, suppose you start Notebook, on the BOOKS database, and make some changes by way of experiment. If you leave the *Edit* module to try out the *Utilities* module, Notebook will immediately save your work, even though you really didn't want to capture the changes.

> ***Note: There is no way to abandon the session!*** *If you find yourself in a situation where you are forced to save some changes you do not want, do not boot the system. This will disrupt the database pointer files, and may force you to restore it from a backup copy, or using the NBFIX program.*

The moral of all this is that you should **always make a backup copy of your database**, before making any significant changes. The simplest way to do this is to keep all your databases in separate directories, with a separate directory for the backup copies as well. This way, making a backup (and by extension, restoring a database) can be done fairly easily, usually by deleting the "garbage" or trashed database and its auxiliary files, and then copying the backup copy from its directory.

Restoring a Database

The Notebook manual contains extensive instructions on how to restore a damaged database, as well as what to do if Notebook crashes. If you experience any difficulty, you should read these instructions very carefully. You then have a fair chance of salvaging something, if not the entire configuration.

Among the instructions given are: 1) remove unnecessary files and run Notebook again, 2) compact the database and run Notebook again, 3) use the NBFIX program, and finally, as a last resort, 4) restore from your backup copy.

Keywords

Notebook has a feature that can be used to generate a list of keywords. You can create your own keywords simply by entering them into a separate field (*Categories* in the example), or you can use the Key function to extract a list of keywords from any field, for the entire database. This function creates an alphabetized list of all the words in the database in the specified field, giving the frequency of occurrence for each word. For example, in the BOOKS database you could key on the *Dates* field to see how many books were published in each year.

On-Line Help

Notebook gives context-sensitive help in nearly all situations. Whenever you press the F1 key, you get a window containing useful tips on whatever function you were using or about to use at the time. You won't always find what you are looking for, but the on-line help will frequently save you a search in the manual. Pressing the Esc key takes you immediately back to whatever you were doing.

Importing and Exporting Text

Notebook can read information created by other databases, word processors, and programs. This includes on-line database services. Imported records are added at the end of the database.

There are two formats for importing records. First, there is the Notebook format. In this case, there must be an exact match between the number and names of fields in the the imported records, and the original database, and the imported records must be in a prescribed format, which looks like the following example:

```
%Start:
%Author:Wortman, Leon A. & Sidebottom, Thomas O.
%Title:The C Programming Tutor
%Publisher:Bowie: Robert J. Brady
%Date:1984
%Categories:computers, programming, C
%Comments:An introduction to the C programming language.
%End:
```

Each field must be preceded by a heading which is identical to the corresponding heading in the Notebook database, delimited by the characters % and :. Also, each heading in the Notebook database must have a corresponding heading in the imported file, and the fields in the imported file must be in the same order.

The Notebook format can therefore be generated by most word processors, using the print-to-file option. For example, in Microsoft Word, you would print to file in un-formatted mode.

The other format is the Basic Format, which is used by Microsoft Basic and many other programs. This includes WordStar's MailMerge and dBASE II's system data file delimited format. This format is described in the Notebook manual.

Special Characters

Notebook has a Keep option that allows you to preserve embedded codes in an imported file, so that the original word processor formatting can be preserved. This enables you to manipulate the text with Notebook, and then create a new file, using the Print module, that can then be run through the word processor for further formatting. Notebook also has a Remove option to remove control characters, and a Mask option to convert extended ASCII characters to their lower ASCII equivalents.

The Options Menu

The *Utilities* module contains an Options menu that allows you to control various features, such as the position of the margin line (left margin), whether to show or hide records marked as deleted, whether Insert or Overtype is to be the default typing mode, the screen mode (mono or color), the background color, the way in which views are handled when you transfer from one module to another (keep current view, etc.), the database ID, the paragraph character, and the field start and end characters.

The Print Module

Notebook can prepare reports containing the records in a database, or any view of it. Reports can be sent to a printer, to the screen for previewing, or to a disk file for later processing by a word processor, posting to a bulletin board, uploading to a mainframe, etc. You can use the default format provided by Notebook, or make your own custom report format.

The Notebook print format includes headers and footers. Headers and footers can contain the page number, automatically incremented on each page, and the date and time stamp. Headers and footers can have multiple-line definitions.

When you create custom print formats, the editor provides you with a 16-line field in which to define text, and there is no scrolling or word wrap. However, you can generate vertical spaces by including the vertical bar symbol (|) in the text of the report.

The usual rules for headers and footers apply. In addition, any text typed in the report body will appear in each record. In this area, the symbol # is replaced by the record number, | inserts a newline, \\ suppresses a newline to join two lines, and ^ sends a form feed to cause a page eject.

The most important aspect of using the *Print* module is the ability to select desired fields to be displayed. The way this works is that when in the Print Format Editor you go to a sub-menu and select a field to be included in the body of the report, and upon return you find embedded in the text a symbol like the following: **<1:0 >**. This entire string behaves like one character (you cannot type it directly), and causes the first record to be printed at that spot in the text. The :0 means that the record length is variable.

Print Options

The Print Options menu allows you to change a variety of parameters pertaining to the print format, such as margins, page size, pause or no pause between pages, etc. (the usual stuff). You can suppress or print any field that is blank, by setting an option. Also, you can generate hanging indents and autoindent on the first line of each field.

Hardware Requirements

Notebook requires two floppy disk drives or a hard disk, PCDOS or MSDOS 2.0 or greater, and a minimum of 256K of RAM. At run time, there must be at least 225K of RAM available. Notebook can be used with many memory-resident programs, including *Random House Reference Set, ProKey, Superkey*, and *Sidekick*, provided there is enough memory available.

Bibliography

Bibliography is a companion program to Notebook. It compares citations in a manuscript with entries in a Notebook database, and constructs a bibliography of all entries cited. The Notebook database therefore acts as a card catalog.

When you prepare a manuscript, you enter citations in your customary form, preceded by a percent sign (%); e.g.,

These entries are read by Bibliography, which searches a Notebook database for corresponding entries, and then constructs a bibliography in whatever format you choose. Also, you can instruct Bibliography to modify the original manuscript; i.e., remove the % signs, create footnotes, or replace citations with their numbers in the bibliography. However, Bibliography **cannot be used to MODIFY a formatted Microsoft Word file**, due to the way in which these files are constructed. It can be used to modify only un-formatted Word files.

Bibliography requires MSDOS or PCDOS 2.0 or higher, and 256K of RAM. Keynames can be up to 40 characters long.

Bibliography can be used with a variety of word processors, such as WordStar, WordStar 2000, Spellbinder, WordPerfect, XYWrite II, and Microsoft Word (with the exception noted above for Microsoft Word).

DOS COPY WARNING

Mike Moran
(Reprinted from Blinkin Cursor *the newsletter of the IBM Personal Computer Users Group in Milwaukee, Wisconsin)*

Assume you are in DOS, with the DOS prompt visible on your screen, and you attempt to copy a file from a disk in drive A to a disk in drive B. Also assume you mistakenly place an important program disk in drive B before you enter COPY A:FILENAME.EXT B:. Fortunately, you are lucky; you left the write-protect sticker on your disk in drive B, so DOS gives you the error message:

> Write protect error writing b:
> Abort, Retry, Ignore?

What you do now will determine whether you loose the data you have on your disk in drive B. If you're like most people, you simply take out the valuable disk from drive B, substitute another partially full data disk, and press either R for Retry, or I for Ignore. If you do this, however, you will be in trouble.

It turns out that one of the first things DOS does when you issue the COPY command is to read and store the filename directory of the target disk. In fact, DOS does this even before checking for write protection. Thus, if you remove the write-protect disk, insert the second data disk, and select either Retry or Ignore, the COPY command continues where it left off. The file directory from the first disk is then placed on the second disk, which makes all the files on the second disk inaccessible (unless you use the DOS Recover command or something like the Norton utilities).

The solution is to Abort in such situations and start over with a blank formatted disk in drive B.

MODEM PROBLEMS WITH CALL WAITING? HOW TO GET AROUND IT

We have heard that people who have the "Call Waiting" feature on their phones often have a problem when they use that line for computer hookup via a modem. Apparently, the beep that notifies you of an incoming call interrupts the carrier tone long enough to cause your modem to break the connection. This, of course, frequently results in the loss of data or work that you have been doing. Listed below are several ways you can get around this problem. We hope this will be of some help to our users.

Cancel Call Waiting

In certain areas, Call Waiting can be canceled on a call-by-call basis. **Before** you place a call (e.g., to a computer), listen for the dial tone; then

1. Dial *70 from a regular push-button phone (or 1170 from a rotary dial or a 10-button phone).

2. Listen again for the dial tone, then dial the number you wish to reach (e.g., the computer).

Call Waiting is then canceled for the duration of that call, and is automatically restored when you hang up. Anyone attempting to call you will get a busy signal.

Remember that you must cancel Call Waiting *before making your call.* (Note: you may want to check with the phone company to see if your exchange has this feature. If it doesn't, you can try another method.)

Call Forwarding

If you also have Call Forwarding on your phone, you can forward your calls to another number before starting your work on the computer. All incoming calls will then be routed to another number. While your phone is on Call Forwarding, it will attempt to produce a short ring to indicate a call coming through; however, this ring is handled differently than a Call Waiting signal, and will not cause problems. Of course, you must remember to deactivate Call Forwarding when you are through, or you won't receive your calls on that line.

Extend The Carrier-Loss Detection Time

This method does work, but unless you have good communications software that checks the data transmission, it will not be satisfactory.

Most communications software packages allow you to increase the amount of time that the carrier tone can be lost without actually breaking the connection. If you set this value to a duration longer than the Call Waiting beep, the connection should be maintained. However, unless you are using an error-free protocol, there will be some loss of data and the addition of extraneous noise characters in your data because of the beep.

SHARED NEWS

Availability of SIR , a call for user EXECs

Bruce Richardson

SIR, the Scientific Information Retrieval System, has recently been added to SHARED. Thanks go to the Departments of Landscape Architecture and Urban & Regional Planning for donating SIR. The DBMS and FORMS segments of SIR have been added to the products in the SHARED facility. To access these products issue the command

```
LINKTO SIR (S
```

Then type

```
SIR
```

or

```
SIRFORMS
```

to access the product. To learn more on how to invoke these two products, issue the command

HELP SHARED SIR

Note that there is on-line help for SIR — once you have invoked SIR, type HELP. Manuals will soon be available for your perusal at the consulting offices. You may also purchase them from SIR Inc., 5216 Old Orchard Rd., Suite 800, Skokie, IL 60077.

NOTE: SIR is not supported by CSO — consulting and maintenence for this product are not assured by CSO.

Pursuant to the discussion of shared Execs at the CMS users' group meeting I have have come up with a plan to implement this idea. If you have any execs or profiles which you would like to share and which conform to the guidelines below please send them to me (CMS userid = RICHARD) or send me a note about them. General purpose Execs could be shared in the framework of the SHARED facility under the following guidelines:

Herein the term Exec should be considered synonymous with the following items: system execs and XEDIT macros, profiles for XEDIT, SCRIPT and the system.

1. There must be provision for describing what the Exec does; e.g., the command "exe-name ?" should display help. Profiles should be commented.

2. A one or two line description of the Exec's function will be made available in a help file for these execs.

3. At certain times (e.g., when system changes necessitate) a house cleaning of Execs will be necessary; at these times I will have to notify users that unless they "vote" for their favorite Exec it will be eliminated.

4. If an Exec stops working or has bugs it will be removed unless the donator is able to fix it.

5. The BULBOARD, bulletin board facility, will be provided for comments and complaints about the Execs and the facility.

6. Users will be able to access the entire set of user Execs via the command

   LINKTO USEREXEC (SHARED

7. Profiles will be limited to those which serve distinct purposes; e.g., SCRIPT profiles for different printer types or profiles for line mode and full screen mode access (distinct from our default) would be welcome.

MSCC SUMMER STATISTICAL CONSULTING

The Mathematical and Statistical Consulting Committee (MSCC) provides assistance to members of the University Community, government, and private industry on statistical problems in their research work. Aid is available in designing experiments, constructing surveys, analyzing data, extending theoretical research, and utilizing computers in statistics.

Up to two hours of consulting is provided free of charge to members of the University Community. Problems that require a considerable amount of consulting time and effort are welcome, but it is necessary to charge clients for such extended services.

To use the service or to set up an appointment to see a consultant, call 333-2167, or stop by the MSCC office in 221 Altgeld Hall. The MSCC hours for the summer are 9 to 12 and I to 5, Monday through Friday.

USER TRAINING PROGRAM

Short Courses, Manuals and Training Cassettes
for the CSO Computer Systems
Summer Semester 1986

SHORT COURSES

CSO is offering the following noncredit short courses during the Summer semester 1986 to acquaint potential users with our computing systems, facilities and services.

Short Course Policy

Please note that:

1. CSO makes a small charge for most short courses. This is due to two factors: (1) There is a need for equipment to support improvement in teaching methods; (2) The volume of short courses has risen to the point where it is a serious drain on consulting staff time, and some compensation in staffing must be made. The income is dedicated to support of the short course program.

2. REGISTRATION IS REQUIRED for all courses except where noted. Registration is accomplished by filling out a SEPARATE copy of the registration form and SEPARATE check or voucher for each registration and sending these documents to CSO in either campus or U.S. mail. Walk-in registrations will be accepted in room 162 DCL.

3. If fees are paid by check, each check must be dated as of the FIRST DAY the corresponding class is taught. Other checks will be returned.

4. The registration form is available on-line from a Cyber terminal via:

   TYPE,REGFORM/AS/UN=COURSES

   or you may call 244-1257 and request that one be sent.

5. Each registrant will be sent a confirmation of registration on which the place of meeting is noted. This slip must be taken to all meetings of the class and shown when requested.

6. Refunds of fees will be made only for canceled classes, or upon receipt of an application for refund on or before the day BEFORE the second meeting of the class. There

are no refunds for classes that meet only once. Application for a refund must be made in room 162 DCL during normal office hours; no applications will be accepted by telephone. Refunds are made by means of a credit memorandum (good for one year); exceptions will be made only in extremely unusual circumstances and at the discretion of the user training coordinator.

7. A copy of the current (updated) short course listing may be examined on-line via:

   TYPE,COURSES/AS/UN=COURSES.

8. Updates (changes) since the printed short course listing was issued may be examined on-line via:

   TYPE,UPDATES/AS/UN=COURSES.

   This file contains current information on courses and sections that have been newly opened, canceled, filled and closed, etc.

9. CSO reserves the right to cancel courses or sections with insufficient enrollment. All fees paid for these classes will automatically be returned.

10. Tax deduction for educational expenses: Treasury Regulation Section 1:162-5 permits an income tax deduction for educational expenses (such as registration fees) undertaken (1) to maintain or improve skills required in one's employment or other trade or business; or (2) to meet express requirements of an employer or a law imposed as a condition for retention of employment, job status, or rate of compensation.

Questions, comments and suggestions should be addressed to the CSO user training coordinator: Ron Szoke, (217) 333-8630; or TELL,SZOKE from a Cyber terminal; or NOTE SZOKE @ UIUCVMD from a CMS terminal; or electronic mail to **uiucuxc!szoke** from a UNIX USENET terminal.

Short Course Summary: Titles

NOTE: For ease of reference, short courses are now classified into six groups, depending on the computing system addressed:

G series: General and Introductory
- G10. Orientation to CSO Facilities and Services

M series: Microcomputers (Especially the IBM PC)
- M15. Basic Concepts in Computer Information Processing
- M21. Quick PC
- M32. Word Processor Survey
- M41. Using a Word Processing Package
- M43. Using a Spreadsheet Package
- M45. Using a Database Package
- M51. Intermediate PC

Computer Graphics

- M61. Introduction to Microcomputer Graphics

Statistical Computing

M75. Micro Versions of Mainframe Statistical Packages

C series: The CDC Cyber Network Operating System (NOS)

C11. Introduction to the Cyber System: NOS Version I
C21. Producing a Document with RNF

Computer Graphics

C62. Using Blaze Graphics

I series: The IBM VM/CMS System

I23. Introduction to IBM Timesharing: CMS and XEDIT
I24. The CMS HELP Facility
I25. Using the Document Composition Facility
I31. Using BITNET
I33. Intermediate CMS
I51. Introduction to the VM/SP System Product Interpreter

Statistical Computing

I76. Introduction to SPSSX
I79. Repeated Measures Analysis Using SPSS, SPSSX, or SAS
I83. Introduction to SAS (Statistical Analysis System)
I85. Introduction to the SAS FSCALC Spreadsheet

Statistical Package Graphics

I97. Introduction to SPSS Graphics

U series: The UNIX System

U11. Introduction to the UNIX System
U41. Intermediate UNIX

Statistical Computing

U73. The S Package for Data Analysis and Graphics

X series: Mixed and Other Systems

X25. Survey of CSO Print Services
X37. Using VMBATCH under CMS from the Cyber

Statistical Computing

X77. Using SAS and SPSS with VMBATCH from the Cyber

Short Course Listing

G series: General and Introductory

G10. Orientation to CSO Facilities and Services

A brief, nontechnical presentation for prospective users on the following topics: the mission and organization of CSO; computing equipment; locations of facilities and hours of operation; available software; where to obtain documentation; user training (short courses and training tapes); consulting and other services; how to set up a computer account. No prerequisites. No fee. NO REGISTRATION IS REQUIRED.

1. June 13 12N-1pm 115 DCL [Szoke]
2. June 16 4pm-5pm 111 Gregory Hall [staff]
3. June 17 8am-9am 120 Commerce West [Szoke]
4. June 25 12N-1pm 163 Electrical Engineering [staff]
5. June 26 8pm-9pm 137 Administration [staff]

M series: Microcomputers (especially the IBM PC)

M15. Basic Concepts in Computer Information Processing

An introductory survey of computer information processing concepts and terminology, intended especially for those thinking of acquiring a small computer or word processing equipment. The needs of UI administrative, clerical and nonacademic personnel have been central to the planning of the course. Some guidelines for buying a personal or microcomputer are suggested, but attendees will NOT be told which one to buy, nor which one is "best." NOTE that there is no laboratory or "hands-on" component to this course. No prerequisite. Fee: $15.

June 16,18 3pm-5pm [Szoke]

M21. Quick PC

A concise review of essentials of using the IBM Personal Computer: basic hardware configuration (keyboard, system unit, disk drives, printer); proper care and handling of diskettes; hands-on experience using the PC-DOS operating system to format a diskette and to copy, type, rename and delete files; software packages available from CSO and how to check them out; how to load and run BASIC programs and other software packages. Prerequisite: Course G10 and familiarity with basic computer terminology equivalent to M15. Enrollment limited to 15 per section. Fee: $10 (includes one diskette).

1. June 17 3pm-5pm [Knott]
2. June 19 3pm-5pm [Knott]
3. June 20 3pm-5pm [Knott]
4. June 27 3pm-5pm [Knott]

M32. Word Processor Survey

This is a descriptive survey of seven word processors which CSO supports, recommends, or considers strong candidates for future support: PC-Write, Volkswriter, Microsoft Word, Nota Bene, T3, PC-TeX, and PWP (Professional Writer's Package/Slavic Version, from Edix/Wordix). Prerequisite: M21 or equivalent. Fee: $20.

July 29,31 3pm-5pm plus one hour TBA [DeWan]

M41. Using a Word Processing Package

How to use a microcomputer (the IBM PC) and word processing package to produce (create, revise and print) publication-ready manuscripts. Prerequisite: Quick PC (course M21) or consent of instructor. Enrollment limited to 12 per section. Fee: $20 (includes one diskette).

1. Volkswriter
   June 23,24,25,26 8am-9am [Szoke]

2. Microsoft Word
   July 21,22,23,24 12N-1pm [DeWan]

M43. Using a Spreadsheet Package

"Electronic spreadsheet" packages (such as VisiCalc, its successors and spinoffs) are widely considered the most impressive and useful software available for microcomputers. This course introduces participants to the analytical and "what if --" capabilities of a new generation spreadsheet package, Lotus 1-2-3 on the IBM PC. Also, glimpses of this package's database and graphics features if time permits. Prerequisite: M21 or equivalent. Enrollment limited to 15. Fee: $25 (includes one diskette).

1. June 30, July 1,2 3pm-5pm [Szoke]

2. July 21,22,23,24,25 8am-9am [Szoke]

M45. Using a Database Package

An introduction to microcomputer database management emphasizing the fundamentals of using database software. Using dBASE II or III we will design and create an information file, enter, select and sort data, and use the package to write a report. If time permits, we may also write a simple program file in the dBASE language. Prerequisite: M21 or equivalent. Enrollment limited to 15. Fee: $25 (includes one diskette).

1. dBASE II and III July 7,8,9,10,11 8am-9am [Szoke]

2. R:base 5000 July 14,15,16,17,18 8am-9am [Szoke]

M51. Intermediate PC

This is a second course in using the IBM PC/XT/AT and PC-DOS. It covers aspects of DOS 2.x and 3.x not covered in the introductory course (M21: Quick PC). Topics include: the EDLIN line editor, device names, global filename characters, tree-structured directories, pipes and filters, batch files, and configuring your system. Other

topics that may be covered as time permits: hard disk usage, batch file commands, the LINK and DEBUG utilities, and using compilers (BASIC, Fortran, Pascal, C). Prerequisite: M21 or equivalent. Fee: $15 (includes one diskette). Enrollment limited to 15 per section.

July 28,30, Aug. 1 8am-9am [Szoke]

Computer Graphics

M61. Introduction to Microcomputer Graphics

This course surveys the varieties of graphics software and hardware commonly available for microcomputers. Topics include the differences among types of software and what each is best used for, the types of input devices such as mouses and digitizers, and hard copy devices such as plotters and printers. The course is intended for newcomers to graphics who are sorting out what equipment they may need. Prerequisite: M21 or equivalent. Fee: $5.

July 22,24 5pm-6pm [Smyser]

Statistical Computing

M75. Micro Versions of Mainframe Statistical Packages

This is a survey course covering the current state of microcomputer (IBM PC compatible) versions of three popular mainframe statistical packages: SPSS, BMDP and SAS. Issues covered will include, but not be limited to, the following: required hardware configuration and operating system; programs/routines available; comparative installation procedures; relative pros and cons; current plans for future development. Demonstrations of each package will be given as time and machine availability permit. Prerequisite: M21 or equivalent. Fee: $15.

July 28,30 7pm-9pm [Roy]

C series: The CDC Cyber Network Operating System (NOS)

C11. Introduction to the Cyber System: NOS Version 1

This course is intended for the first time Cyber 175 system user. Covers signing on, obtaining system information, and basic file concepts and maneuvers. The emphasis is on timesharing usage and the ICE text editor. Batch usage may also be discussed. Prerequisite: course G10. Fee: $15. Enrollment limited to 10 per section.

June 23,24,25 7pm-9pm [Albin]

C21. Producing a Document with RNF

A general discussion of the broader aspects of document production on the Cyber, including the RNF text formatter, the ICE file editor, dealing with multiple files, thesis office requirements and special packages, and printer selection. Prerequisites: C11 or C12 or equivalent knowledge of the Cyber system and ICE. Fee: $5.

June 30 7pm-9pm [DeWan]

Computer Graphics

C62. Using Blaze Graphics

Blaze is a versatile library of Fortran-callable subroutines for producing X-Y graphs. It is built upon DI-3000, though no knowledge of DI-3000 is necessary for using Blaze. The full range of DI-3000's device-independent functionality is available to the user. Assumes a working knowledge of Cyber Fortran. Fee: $5.

July 7,9 4pm-5:30pm [Albin]

I series: The IBM VM/CMS Systems

I23. Introduction to IBM Timesharing: CMS and XEDIT

This course presents an introduction to general CMS (Conversational Monitor System) virtual machine and XEDIT concepts. The CMS portion covers standard and locally written CMS commands and utilities, sending files between the Cybers and CMS, guidelines for utilizing the available documentation, how to use the full-screen simulator (SIM3278). The XEDIT portion introduces the text editor used under CMS. The presentation covers useful commands for both "ASCII typewriter" and "full-screen" or "simulated full-screen" terminals. Useful locally written XEDIT commands are also discussed. Required reference and recommended prior reading: *CMS Primer*, available at the CSO Distribution Office, 1208 W. Springfield. Prerequisite: course G10 or equivalent knowledge. Enrollment limited to 14 per section. Fee: $15.

1. June 23,25,30, July 2 7pm-9pm [Roy]
2. July 7,9,14,16 7pm-9pm [Richardson]
3. July 21,22,23,24,25 8pm-9pm [Engelbrecht-Wiggans]

I24. The CMS HELP Facility

This course introduces the CMS HELP facility--how to use it, how to create help files and help menus, and a survey of what help files are currently offered. Prerequisite: I23 or equivalent. Fee: none.

July 3 12N-1pm [Kerr]

I25. Using the Document Composition Facility

This course is an introduction to using SCRIPT/VS, a component of IBM's Document Composition Facility, to produce publication-ready documents. The Generalized Markup Language (GML), which provides a means to describe your document to SCRIPT, is the primary focus of this course. Prerequisite: I23 or equivalent knowledge of CMS and XEDIT. Fee: $20.

July 14,16,17 4pm-6pm [Gengler]

I31. Using BITNET

This is a brief presentation on how to use the BITNET communications facility, a network which links UIUC with over 1200 computers at over 300 universities in the USA,

Canada, and Europe, and which allows the transmission of files as well as messages. Prerequisite: I23 or equivalent knowledge of CMS and a CMS logon. Fee: none.

July 1 12N-1pm [Wetzel]

133. Intermediate CMS

This course is designed for CMS users having at least six months' experience with CMS. Very little introductory CMS material will be reviewed. The course treats in more detail some topics in the introductory CMS course (I23) as well as discussing more advanced topics such as execs, efficient space utilization, an introduction to using magnetic tapes, customizing your CMS work environment, and some commands useful in advanced CMS applications. Enrollment limited to 20. Prerequisite: I23 or equivalent. Fee: $25.

July 8,10,15 3pm-5pm [Kesner]

151. Introduction to the VM/SP Product Interpreter

This is an introduction to the System Product Interpreter (SPI) under CMS. SPI is a facility which allows you to write programs comprised of CP, CMS, and/or XEDIT commands using one of three languages: EXEC, EXEC2, or REXX (the Restructured Extended EXecutor language). Using SPI, you can write or tailor your own CMS commands (called "execs") or XEDIT commands (called "macros"). You can also write procedures (called "execs") which accomplish a sequence of repeated tasks by simply entering the name of the exec. This course gives an overview of SPI with primary emphasis on the REXX language. Examples will include creating your own PROFILE EXEC and PROFILE XEDIT files. Prerequisites: I23 or the equivalent. Recommended references: *The VM/SP System Product Interpreter User's Guide* and the *VM/SP System Product Editor User's Guide*, available at 1208 W. Springfield. Fee: $10.

July 14,16,18 8am-9am [staff]

Statistical Computing

176. Introduction to SPSSX (Statistical Package for the Social Sciences)

This course is designed to present the basics of SPSSX usage. Topics will include file definition, data input, and sample procedure specification. The emphasis of the course will be on the structure and implementation of SPSSX programs. Examples will be used extensively. Recommended reference: *SPSSX Introductory Statistics Guide*, available from the CSO Distribution Office, 1208 W. Springfield for $14. Prerequisite: I23 or equivalent. Fee: $25.

July 21,23 4pm-6pm [Mills]
Lab: July 26 9am-11am

179. Repeated Measures Analysis Using SPSS, SPSS-X or SAS

After a review of concepts and terminology useful for understanding SPSS and SAS documentation for repeated measures analyses, examples are presented step by step with emphasis on the interpretation of output. Guidance is provided on choice of contrasts for answering specific research questions and on presentation and summarization of results. Course describes use of SPSS or SPSS-X MANOVA for repeated measures

analysis, followed by a discussion of the new REPEATED option in SAS GLM (Version 5). For comparison, the same data are analyzed using SPSS-X MANOVA and SAS GLM. Prerequisite: Some knowledge of analysis of variance and at least minimal experience using a statistical computer package. Fee: $15.

June 24,26 4pm-6pm [Alster]

I83. Introduction to SAS (Statistical Analysis System)

An introduction to SAS processing using the IBM CMS timesharing system. Topics include using SAS interactively and non-interactively, using the DATA and PROC steps, creating temporary and permanent SAS data sets under CMS, reading and writing external data files, using basic SAS procedures, programming in the DATA step, using SAS Display Manager (the SAS Full-Screen Interactive Product) to interactively edit and submit SAS jobs, and an overview of CSO SAS features and services. Prerequisite: I23 or equivalent knowledge of CMS and XEDIT. Recommended references: *SAS Introductory Guide* and the *SAS Companion for the VM/CMS Operating System.* Fee: $20.

July 8,10 7pm-9pm [Dingler]
Lab: July 12 10am-11am

I85. Introduction to the SAS FSCALC Spreadsheet

The SAS FSCALC procedure provides spreadsheet analytical tools on the IBM mainframe computers under the CMS timesharing system. This course introduces you to the capabilities of FSCALC, including using features of the SAS-like programming language of FSCALC to define the relationships of spreadsheet rows and columns, processing SAS data sets as spreadsheets, and producing SAS data sets from FSCALC spreadsheets. Prerequisite: Introduction to SAS (I83) or equivalent knowledge. Fee $25. Enrollment limited to 20.

July 22,24,29 3pm-5pm [Kesner]

Computer Graphics

I97. Introduction to SPSS Graphics

Features of the new SPSS interactive graphics product will be reviewed using examples. Step by step, the process for obtaining plots will be explained, using handouts sufficient for participants to reproduce the plots. Pie charts, bar charts, line charts, maps and text will be covered. Prerequisite: I23 or equivalent and familiarity with SPSS. Fee: $10.

July 1 3pm-6pm [Mills]

U series: The UNIX System

U11. Introduction to the UNIX System

This course introduces the new user to the UNIX timesharing system and the "ex" editor. It covers terminal setup, logging in and out, basic "ex" commands, file commands, and useful utility programs. It also discusses the "mail" and "mesg" facilities,

how to set up a file directory, and how to use the on-line help programs. Prerequisite: G10. Fee: $15. Enrollment limited to 10 per section.

1. June 16,18 7pm-9pm [staff]

2. July 22,24 7pm-9pm [Scheid]

U41. Intermediate UNIX

An explanation of shell concepts is given: redirecting input-output, pipelines, filters, tees, background processing, shell scripts and subshells. Features specific to the C and Bourne shells are covered. The UNIX "make" utility will also be discussed. Prerequisite: U11 or equivalent. Fee: $15. Enrollment limited to 10 per section.

July 28,30 7pm-9pm [Pommert]

Statistical Computing

U73. The S Package for Data Analysis and Graphics

S is an interactive statistical environment available on UNIX machines. It comprises a high-level language for specifying computations and a support system for data management and graphics. This introductory course provides an overview of S commands and an exposure to the S environment. The flexibility and graphical capabilities of S will be stressed. The course is divided into lecture/discussion and hands-on sessions using S. Recommended references: R.A. Becker and J.M. Chambers, *S: An Interactive Environment for Data Analysis and Graphics*; J.M. Chambers and others, *Graphical Methods for Data Analysis*. Prerequisite: U19 or equivalent and a good grasp of basic statistical analysis. Enrollment limited to 15. Fee: $15.

July 21,23 7pm-9pm [Richardson]

X series: Mixed and Other Systems

X25. Survey of CSO Print Services

An overview of how things are printed from the various CSO computers, including special print services such as the Xerox 2700 and IBM 3800 laser printers. Prerequisite: C11 or 123 or U11 or equivalent. Fee: none.

July 2 4pm-6pm [staff]

X37. Using VMBATCH under CMS from the Cyber

An introduction to the features of the VMBATCH facility on CMS, which enables a Cyber user to submit a batch job to the IBM CMS system. Prerequisite: C11 and 123 or equivalent; Cyber and CMS signons. Fee: none.

June 26 3pm-5pm [Kerr]

Statistical Computing

X77. Using SAS and SPSS with VMBATCH from the Cyber

VMBATCH can be used to submit SAS and SPSS jobs from the Cyber. This course will introduce the necessary job control and programming statements for this type of processing. Since VMBATCH is used under the CMS operating system, an explanation of the file naming scheme and disk management techniques will be given. Prerequisite: C11, 176, and 183 or equivalent. Fee: $5.

July 31 4pm-6pm [Dingler, Mills]

MANUALS

The following Cyber manuals are strongly recommended for certain short courses. These documents may be purchased individually at the Illini Union Bookstore (Reference Section), 715 South Wright Street, or may be purchased as a set at the CSO Distribution Office, 1208 W. Springfield.

1. Introduction to the Cyber Systems, $2.00
2. A Tutorial Guide to the ICE Text Editor, $1.25
3. ICE Reference Manual, $3.25
4. RNF Documentation: Tutorial, Macros and Reference, $4.00 (NOTE: This manual is not included in the package; it must be purchased separately.)
5. An Index to Software on the Cyber, $3.25
6. Cyber Fortran Debugging, $1.25

The following IBM/CMS manual is recommended for CMS users, and is available at 1208 W. Springfield:

CMS Primer, Release 3, $6.00

TRAINING CASSETTES

CSO makes available to the user community nineteen videotape training cassettes: three introducing the Cyber system, six on the fundamentals of using SAS (Statistical Analysis System), and ten on SAS color graphics (SAS/GRAPH). The tapes may be obtained at the Media Desk in the Undergraduate Library (upper level, in back). Show your University ID to the clerk on duty there and state the title of the videotape you wish to use. If a machine is available, you will be taken to a room containing the videotape equipment and shown how to operate it. If all machines are in use you can make a reservation for a later time.

CSO Videotapes

CSO has produced a series of three videotapes (comprising eight segments) which introduce the novice to computing on the Cyber system. A viewing guide containing the major displays in this series is available and can be used to facilitate note taking. Ask for your free copy of the

viewing guide when you check out any of these videotapes for viewing. The title and a brief synopsis of each segment is given below. Running time is 10 to 15 minutes for each segment.

1. **CSOVT1.**
   1.1 Introduction to Computing at CSO: A brief look at the steps required to solve a problem using a computer, and at some of the hardware used.

2. **CSOVT2.**
   2.1 Using a Terminal: A description of the physical operation of a terminal and some of the keys that have a special meaning to the Cyber.

   2.2 Introduction to Cyber Timesharing: A tutorial on logging on and off the Cyber.

   2.3 File Usage: Local files and indirect access to permanent files. An introduction to Cyber files and the commands used to manipulate them.

   2.4 Introduction to ICE Text Editing: A tutorial on entering and modifying files with ICE.

3. **CSOVT3.**
   3.1 Running a Fortran Program: Concepts. A discussion of the concepts of compilation, loading and execution.

   3.2 Running a Fortran Program: The PROGRAM statement. A discussion of the PROGRAM statement and its relationship to files accessed by the program.

   3.3 Running a Fortran Program: Control Statement. A discussion of the control statements used to compile, load, and execute a Fortran program.

A copy (Beta-1 format) of these videotapes is available for loan from CSO to any instructor wishing to use them in class. They have been effectively used in this environment several times recently, with the instructor stopping the playback equipment whenever he/she wished to elaborate further or questions arose from the class. To borrow a videotape for classroom use and obtain copies of the viewing guide for class distribution, call the CSO training coordinator: Ron Szoke, 333-8630. If you do not already have access to the required videotape equipment, Betamax viewing equipment can be borrowed from the Office of Instructional Resources, 333-3690.

SAS Videotapes

CSO has leased the SAS Basics 100-Series video training course. The course combines video and workbook media to deliver performance-based SAS training. The information in the course is contained in six videotapes.

The videotaped instruction is not complete without the workbook, which contains exercises and illustrations to reinforce the material presented in the videotapes. A copy of the workbook is available for reference at the Media Desk. You may, however, wish to obtain a personal copy of the workbook to complete the exercises, to take notes, and to use as a reference after the course is completed. The workbook may be purchased for $8.00 at the CSO Distribution Center, 1208 West Springfield, Urbana.

NOTE: The SAS videotapes are not available for loan.

The title of each of the videotapes is given below. Running time is about 45 to 60 minutes for each tape.

B101. Introduction to SAS.

B102. Getting Your Data Into a SAS Data Set.

B103. Program Processing.

B104. Working with SAS Data Sets.

B105. Report Writing.

B106. SAS procedures.

A Cyber terminal user may obtain more information about each via:

```
TYPE,SASVID/AS/UN=COURSES.
```

The Media Desk also has the ten tapes in the SAS color graphics (SAS/GRAPH) series and a reference copy of the student workbook. For more details:

```
TYPE,SASGRAF/AS/UN=COURSES.
```

Audio Cassettes

CSO makes available to the user community three sets of audio cassette tapes for the training of microcomputer users:

1. How to Operate the IBM Personal Computer (on 3 cassettes)
2. How to use MultiMate (3 cassettes)
3. How to use Lotus 1-2-3 (4 cassettes)

These cassettes, with accompanying printed materials, may be borrowed for up to one week by contacting Ron Szoke, 333-8630.

Computing Services Office -- UIUC
Short Course Registration Form, Summer 1986

Note: USE A SEPARATE SHEET FOR EACH COURSE. This form may be copied freely as needed. Fill in all blanks down to the "* * *" and send completed forms to: CSO Short Courses
150 DCL
1304 West Springfield
Urbana, IL 61801

University ID (Social Security) number (9 digits)

Name: (Please print clearly)
last first

_____ _____, _____

Status: Undergrad Grad Faculty Ac staff Non-ac staff Other

Telephone: Office _____ Residence _____

Send receipt to: (address)

_____

_____

_____ CAMPUS MAIL or ZIP _____

Course number	Section number	Course title	Course fee enclosed
_____	_____	_____	$_____

Paid by:

_____ Check dated as of the first day of the course, and made payable to the University of Illinois.

_____ University account: Attach a signed STORES / SERVICE Voucher (Form 11-48-8000) credited to CSO, 150 DCL; Account: 1-3-10104-0798, Computer Service. The department, account number (11 digits), and title to be charged must also be filled in. NOTE: "Real money" accounts only; Research Board, SARA, and class accounts are NOT acceptable.

- -

This portion will be returned. You MUST take it to class with you.

Computing Services Office -- UIUC
Short Course Registration Receipt and Admission Slip, Summer 1986

Course Number/Section/Title Last name Initial

_____ _____, _____

Date(s) and time: _____

* * *

Meets in room: _____

Validation by registrar: Date: ____/____/_____

RS 05/26/86

OFF-LINE's Mailing List

If you wish to be placed on our mailing list for future issues of *OFF-LINE*, if you wish to be removed from the list, or if you wish to enter an address correction, please complete and return this page. **(Current subscribers are kept on the mailing list until a specific request for removal is received, or until a mailing is returned as undeliverable.)**

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First name -- Initial -- Last Name

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department

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Room - Building

Off-campus Address:

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Organization or Company (if applicable)

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Street Address

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If address correction, give old address and zip code below.

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3/86

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150 Digital Computer Laboratory
University of Illinois at Urbana-Champaign
1304 West Springfield Avenue
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CSO SITES

CSO NORTH (DCL)	
14 Digital Computer Lab 333-7685	Monday-Saturday, 24 hours/day Sunday, 12 noon - 12 midnight
CSO SOUTH	
70 Commerce West 333-4500	Monday-Saturday, 8 am - 12 mid. Sunday, 12 noon - 12 midnight
AGRICULTURE	
N-120 Turner Hall 333-8170	Monday-Thursday, 8 am - 10 pm Friday, 8 am - 5 pm Saturday-Sunday, Closed
CHEMISTRY	
150-154 Noyes Lab 333-1728	Monday-Friday, 9 am - 5 pm Saturday-Sunday, Closed
CRH SNACK BAR	
120 Snack Bar 333-1851	Daily, 12 noon - 12 midnight
ELECTRICAL ENGINEERING	
146 Electrical Engineering 333-4936	Monday-Friday, 8 am - 12 mid. Saturday, 8 am - 5 pm Sunday, Closed
FAR	
Florida Avenue Residence Halls 333-2695	Daily, 12 noon - 12 midnight
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Illinois Street Residence Halls 333-0307	Daily, 12 noon - 12 midnight
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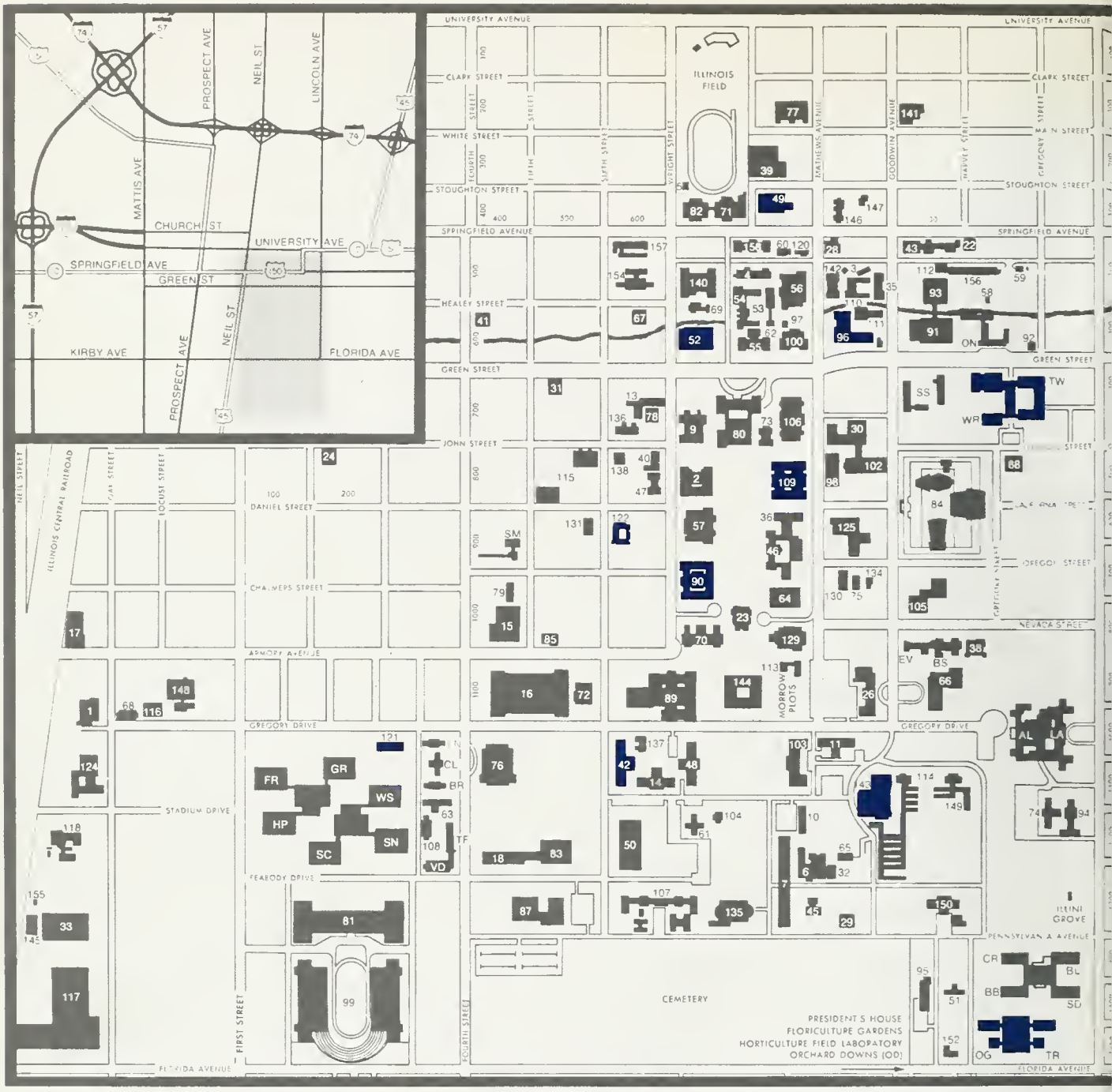
65 Mechanical Engineering 333-1430	Monday-Saturday, 8 am - 12 mid. Sunday, 12 noon - 12 midnight
PSYCHOLOGY	
453 Psychology 333-7815	Monday-Friday, 8 am - 5 pm Saturday-Sunday, Closed
SOCIAL SCIENCE	
202 Lincoln Hall 333-0309	Monday-Friday, 8 am - 12 mid. Saturday, 10 am - 5 pm Sunday, 12 noon - 5 pm



42 Commerce West
49 Digital Computer Lab
52 Electrical Engineering
90 Lincoln Hall

96 Mechanical Engineering
109 Chemistry - Noyes Lab
121 CRH Snack Bar
122 Psychology

143 Agriculture - Turner Hall
Illinois Street Residence Halls
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off line

versity of Illinois at Urbana-Champaign

ctor: George Badger
or: Lynn Bilger

puting Services Office

CSO DIRECTORY

USER SERVICES AND HARDWARE/SOFTWARE SUPPORT

User Accounting	**1208**	**W Springfield**	**333-7752**
Documentation Center	**1208**	**W Springfield**	**333-9230**
Systems Consulting	**1208**	**W Springfield**	**333-6133**
Statistical Services Consulting	**85**	**Comm West**	**333-2170**
PC Consulting	**91**	**Comm West**	**244-0608**
Text Processing Consulting	**212**	**CSOB***	**333-7318**
Maintenace & Repair Service	**194**	**DCL**	**333-0969**
Tape Service, Special Plots, Xerox Laser Printer	**123**	**DCL**	**333-8640**

DIAL-UP NUMBERS

CYBER 175 (NOSA)	**300 baud**	**333-4000**
CYBER 174 (NOSB)	**300 baud**	**333-4004**
IBM 3081 GX (VMD)	**300 baud**	**333-4006**
Switch	**1200 baud**	**333-4008**
TELENET (local no.)		**384-6428**

CSO STAFF

Director	George Badger	150	DCL	333-4103
Business Manager	Stanley Rankin	150	DCL	333-6530
Secretary	Joyce McCabe	150	DCL	333-1637
Networking	Sue Greenberg	187	DCL	333-3723
Systems & User Services	Ahmed Kassem	185	DCL	333-7159
Hardware Maintenance & Communication	Mike Gardner	173	DCL	244-0914
Personal Computers/EXCEL	Robert Penka	119	CSOB*	333-4709
Supercomputer Activities	Sandra Moy	1207	W Springfield	333-9772
Maintenance	Larry Crotser	131C	DCL	333-5190
Consulting	Stan Kerr	208	CSOB*	333-4715
Statistical Services	Joan Alster	202	CSOB*	244-0937
Accounting Services	Gary Bouck	1208	W Springfield	333-7752
Microcomputer Laboratory	Jack Knott	102	CSOB*	333-6562
User Training (Short Courses, Videotapes)	Ron Szoke	108	CSOB*	333-8630
Documentation	Lynn Bilger	207	CSOB*	333-6236
CYBER-IBM-VAX Operations	Myra Williams	168	DCL	244-0186
Site Operations	Sylvia Hansen	65	ME	333-6285

*CSOB is the new CSO Office Building, 101 S. Gregory, Urbana.

Academic and research computing is done on the following machines: CDC Cyber 175 running NOS 1; CDC Cyber 174 running NOS 2; IBM 3081 running VM; IBM 4341 running VM; VAX 11/780 running UNIX and driving a GSI CAT-8 phototypesetter; three Pyramids and a Sequent running UNIX. In addition CSO serves as Facility Manager for various departmental machines (e.g., other IBMs) and for the National Center for Supercomputing Application's CRAY X-MP.

Operating Hours (see HEARYE,SCHEDUL for exceptions):

	CYBER 174/175	IBM
M-F	8 am - 6 am	8 am - 6 am
SAT	8 am - Midnight	8 am - 6 am
SUN	Noon - 6 am	Noon - 6 am

Volume 14
Number 9-10
September-October, 1986

Contents

OFF-LINE is the monthly newsletter of the Computing Services Office at the University of Illinois, Urbana-Champaign. Mention of manufacturer and trade names in this newsletter does not imply endorsement. Information in this issue is current as of September 22, 1986. Articles, suggestions, comments and/or subscription requests may be sent to: Lynn Bilger, Off-Line Editor, 150 Digital Computer Lab, University of Illinois, 1304 W. Springfield, Urbana, IL 61801.

A WORD FROM THE DIRECTOR

George Badger

CSO is soliciting your advice concerning your central computing requirements over the next several years. In order to understand the future computing needs of the campus, we are conducting a series of meetings, beginning with departmental and college computer committees. It is very important that the campus community participate in the planning and decision processes — we welcome the opportunity to meet with anyone who wishes to talk with us!

As some of you know, our current environment consists of 15 machines of VAX size or larger: our computational servers include an IBM 3081 and a CYBER 175; we operate an IBM machine primarily dedicated to students of the College of Commerce and several UNIX machines for students of Computer Science and Electrical and Computer Engineering. Many of our remote sites provide microcomputers for both student and faculty use. And finally, we operate five machines dedicated specifically for the use of schools, colleges or other campus units: a VLSI machine for Electrical and Computer Engineering, a CAD/CAM machine for the College of Engineering, and machines for the two supercomputer centers.

The questions which need to be answered concern the future: We intend to replace the CYBER 175 service; what service should we put in its place? How can we provide terminal, network server and batch services to the academic community in support of instructional and research programs? In the next four years, how much will the need for Central Computing Capacity grow? What are the major functions to be accomplished and what machinery should we provide to do that? Do we need another mainframe? Do we need several small machines and a CRAY-like processor? How important is a vector processor? What are the current bottlenecks? Will VMS service come from the campus or from privately owned MicroVAXs? How important is UNIX? Which units on campus plan to be self-sufficient? What software do our users need? Which compilers, graphics packages, statistical packages are important to our faculty and students?

Our tentative schedule includes: user and vendor discussions during the next three months, with a decision early next year about a computer system to replace or augment our current hardware; a recommendation to the Board of Trustees in February or March; and installation next summer. If you would like to meet with us or comment on our plans, please do so. Call Ahmed Kassem at 333-7159 or Sue Greenberg at 333-3723 or write to us at 150 Digital Computer Laboratory.

CSO SUMMER UPDATE

Ahmed Kassem

In the May issue of *Off-Line*, we introduced an electronic method (the SUGGEST command) for receiving comments and suggestions from our users. Since then, we have received a moderate, but helpful response from you. Most suggestions dealt with documentation on IBM/CMS use and inquiries regarding the status of CSO sites. This article provides a summary of CSO's efforts in responding to your suggestions while, at the same time, working toward our goals. Briefly, the following points highlight this past summer's schedule:

I. Processed and installed four new printers to replace older printers in Lincoln Hall, Turner Hall, and the Mechanical Engineering sites.

2. Converted Room 219 in the Psychology Building from ASCII terminals to 15 full-screen graphics terminals and a printer to provide direct access to the IBM machine.

3. Replaced some of the old line-oriented terminals at CSO sites with full-screen terminals, and converted all of the public terminals at CSO sites to have either SYTEK or switch access to the mainframes (VMD, VME, and NOSA).

4. Established a Macintosh laboratory for CS101 and CS102. In addition, some Macintosh PCs have been placed at CSO sites for public use: 50 at ME, 20 at Snack Bar, 15 at FAR, and 15 at ISR.

5. Completed the installation of the 3800 laser printer at DCL, which is available for public use.

6. Published many new Reference Guides relating to the IBM and UNIX systems. These Reference Guides are available at all CSO sites. For a complete listing of all available Reference Guides, refer to Reference Guide RF-0.1.

7. Published a new booklet entitled *Introduction to Computing Services Office* that describes CSO computers and available software, along with CSO services, accounting information, and site information. These booklets can be obtained, free, at 1208 W. Springfield, Urbana. (Note: due to a heavy demand for these books, we may be temporarily out — more are being printed, however, and should be available soon.)

8. A new CMS primer is being prepared which will provide a general introduction to using the IBM systems. We anticipate that this new manual will be available by late October.

9. Installed a new release of the VM/CMS operating system which fixed some known "bugs" in the previous release. The highlights of this new release were published in the last issue of *Off-Line*.

By continued use of the SUGGEST command, you can inform me about your areas of greatest concern. Your ideas are useful to CSO as we plan our future course of action.

The Economics Department and CSO jointly support a half-time consultant to assist students and faculty with econometrics and business statistics. This summer, Matt Higgins accepted this position. Matt completed his BS and MS in economics at the University of Illinois, and is currently working on his doctoral dissertation in econometrics. Matt will be consulting on SAS/ETS, SAS/IML, RATS and SHAZAM. He is the CSO coordinator for RATS. For the Fall semester, Matt will be consulting in Room 83 Commerce West (333-1066) on Tuesdays from 10am-Noon and on Fridays from 1pm-3pm. Matt's principal computer signon is HIGGINS on VMD.

7-TRACK TAPE DRIVE REMOVED

Changing the Name of a Labeled Tape on the Cyber

Becky Wetzel

7-track tapes are almost a thing of the past, and the 7-track tape drive on the Cyber 175 has been used only rarely in the past few years. We said some time ago that the 7-track drive would be removed, and it will be removed on October 8, 1986. The drive has been replaced with a 9-track dual density 1600/6250 bpi drive. Thus, we now have four 9-track 1600/6250 bpi tape drives and one 9-track 800/1600 bpi drive on the Cyber 175.

One of the few uses of the 7-track drive in the recent past has been to provide a means of changing the name of a labeled tape on the Cyber. A labeled tape was mounted on the 7-track drive, which could not read the existing 9-track internal label, a small bit of information was written on the tape, then the tape was dismounted and remounted on a 9-track drive with LB=KL,QN=1,PO=W,W. The 9-track drive could not read what the 7-track drive had written and agreeably accepted the tape as unlabeled and proceeded to label it with the desired new label.

Other techniques for changing the name of a labeled tape on the Cyber are now needed, and three are suggested.

Technique One

The first technique uses a combination of the locally modified Cyber VSN and BLANK statements. The VSN/BLANK sequence accepts your Cyber labeled tape as input (the tape is mounted after the BLANK statement), and the BLANK statement writes a new VOL1 label and prototype HDR1 and EOF1 labels on the tape, labeling the tape with your desired new name. The syntax is:

```
VSN,BLKTAPE=oldtapename-rack.
BLANK,VSN=newtapename,D=density,CV=AS-or-EB,U.
```

The **oldtapename-rack** is the current tape name and rack number. Note that the external label on the tape must match the already existing internal label when this technique is used. **BLKTAPE** is the required local file name in this command. The **newtapename** is the desired new tape name, **density** is the density at which the new label is to be written, i.e., 800, 1600, or 6250, and either **AS** (for ASCII) or **EB** (for EBCDIC) should be used to designate the character code of the new label.

Thus, to relabel tape MYTAPE, rack K000, as OKRA, labeling it in EBCDIC at 1600 bpi, you would use:

```
VSN,BLKTAPE=MYTAPE-K000.
BLANK,VSN=OKRA,D=1600,CV=EB,U.
```

After this has run, you must go to room 123 DCL to change the external name of the tape (the name on the outside of the tape reel) to match the new internal name. Thereafter, you can use the tape as a labeled tape under its new name with the standard LABEL statement. Use QN=1,PO=W,W on the first such use to have the HDR1 label of the first file rewritten to your specifications.

Technique Two

In the second technique, you mount your Cyber labeled tape as an unlabeled tape, and write a file mark at the beginning of the tape, overwriting the current VOL1 label. You then go to room 123 DCL and change the external name of the tape to the desired new label. After this, your now unlabeled tape can be mounted and labeled with its new name by including LB=KL,QN=1,PO=W,W on the LABEL statement when you next use the tape. For example:

```
first job
  LABEL(TAPE,VSN=oldtapename-rack,D=density,LB=KU,PO=W)
  WRITEF,TAPE.

a later job
  LABEL(TAPE,VSN=newtapename-rack,D=density,CV=AS-or-EB,LB=KL,
  SI=newtapename,QN=1,PO=W,W)
    .
    .
    .
```

The terms **oldtapename, newtapename, density**, and **AS-or-EB** are as explained under technique one. The external name on the tape must match the existing internal name in the first part of the example, then it must be changed to the desired new name for the second part.

Technique Three

The third technique uses a VMBATCH job sent from the Cyber to IBM CMS to overwrite the existing internal tape label. The tape may then be newly labeled on the Cyber as shown under Technique Two, 'a later job'.

To run the VMBATCH job, use ICE to create a Cyber file containing the following lines:

```
col 1                                  col 33
    |                                      |
    *BATRJE.TAPLABELJOB                    T
    &TRACE ALL
    EXEC VMROUTE
    EXEC MOUNT tape-rack RING IN AS 181 DEN 1600 (WAIT
    &IF &RC NE 0 &EXIT
    TAPE WTM (DEN 1600
```

Use your external tape name and rack in place of **tape-rack**. Send this job to the IBM with the SENDJOB command, i.e., if the file you created with ICE is called TAPLAB, then type SENDJOB,TAPLAB after leaving ICE. The output from this job will be returned to your Cyber FETCH queue under the name OUTPUTX.

Unlike the preceding techniques, the external tape name need not match the internal name when this IBM job is run. It must, of course, match the desired new name when the tape is later used on the Cyber.

Important Notes

Technique three most closely resembles the old 7-track technique for changing the name of a labeled tape. The external tape name need not match the unwanted internal tape name when

the job is run to obliterate the internal name, and the technique works regardless of the nature of the already existing label. But some may prefer to keep their usage on the Cyber.

There are only a few cases in which you cannot use techniques one or two to change the label of a tape. The most common is when column eleven of the existing VOL1 label is nonblank. A VOL1 label (the 80-character first record on the tape which contains the tape name) begins with the characters VOL1 followed by a six-character tape name. The next character, column eleven, is used by the Cyber to indicate volume accessibility. If column eleven is blank, as it generally is when the Cyber wrote the original VOL1 label, then you can use any of the techniques to relabel the tape. If column eleven is nonblank, you can only use technique three. An IBM labeled tape or a tape on which the Cyber was used to rewrite an IBM VOL1 label (PO=W,W without first overwriting the old IBM label) will have a 0 (zero) in column eleven and will require you to use technique three. (If you run a LISTLB or an EXAMINE on your tape, the output will display the VOL1 label and show if column 11 is blank or nonblank.)

Because the names of tapes are critical both to identify a tape and to ensure that a correct tape is mounted, changes of the external name of a tape will not be done by telephone. Please go in person to room 123 DCL to change the external name of your tape.

NEW CAMPUS COMPUTER NETWORK BEING INSTALLED

Claudia Jordan

The Computing Services Office is in the process of installing a new computer network for the campus. Today, virtually every building on campus houses some computer equipment. Although many departments have installed networks to connect the computing equipment within their own building, connection to computing equipment in another building must be done using either a phone line or LocalNet (Sytek). The new network will provide an alternative connection between buildings -- between existing networks.

Our goal is to provide a link between an existing network in a building and a new network running between buildings. To do this a "gateway" machine (provided by the department(s) in the building) is connected to the existing network in a building and then CSO will provide the link to the new network. Some of these gateway machines are Sun micro computers which work exclusively to route data between the two networks.

Many of the networks currently in place within buildings run over Ethernet (copper coaxial cable). Between the buildings, the new network will use the latest in fiber optic (glass) technology. The fiber being used is 65.5 microns in diameter, which is about the diameter of four human hairs. Around the optic fiber are wrapped several layers of protective covering. So sensitive is this thread of glass that the beam from a flash light shown down the cable in the Astronomy Building can be seen three blocks away at the other end of the cable in the Digital Computer Lab.

This state-of-the-art technology will allow individuals in one building to send data thru their building network to a gateway machine, which, in turn, will route the data across campus (thru the new fiber network) to another gateway in the destination building. This second gateway will then route the data thru its in-building network to the user's desired destination.

Currently the network is capable of supporting TCP/IP, (Transmission Control Protocol/Internet Protocol). This is a well-defined open protocol supported by a variety of

vendors. This software is available on most Unix machines; in addition, TCP/IP software can be purchased for other operating systems. CSO will support other protocols in the future; DECnet is a priority for early 1987.

Buildings that are currently connected to this network are: Digital Computer Lab, English, Coordinated Science Lab, Talbot and the National Center for Supercomputing Applications (formerly Water Resources). Those at Materials Research Lab can DECnet to a 730 VAX which can transfer to the campus network; the Nuclear Physics building has a 56 kilobits serial line to DCL and at DCL it can jump on the network. Buildings that are soon to follow are Astronomy, Administration, Civil Engineering, Engineering Hall, the new Center for Complex Systems Research on 6th Street, Noyes Lab, Roger Adams Lab and Loomis Lab. The Chicago Circle Campus will have a 56kb serial line to the Administration Building where it can jump on the network.

This new network will also be connected to two national networks: ARPAnet and the National Science Foundation network (NFSnet). Universities and government sites across the U.S. have connections to ARPAnet. NFSnet is actually a collection of networks, including a new satellite network of universities (note the dish on top of DCL), and a backbone network connecting the various new supercomputing centers, (U of I, Princeton, San Diego, Cornell and Carnegie Mellon).

So how do you use the network? The initial intent of the network is to provide three main services: remote login, file transfer between machines and electronic mail across campus. First you need to know the machine name of the remote computer you wish to access. Second, if you would like to login, you must have a signon on that machine. After logging on to your local computer enter the command:

```
telnet remote-machine-name
```

You will be prompted for your signon and password. You then will be logged in on the remote computer and you can interact with it as if your terminal were directly connected. Logging out will return you to your local machine. If you want to transfer files between machines: give your local machine the command:

```
ftp remote-machine-name
```

(ftp stands for file transfer protocol). After that, simply type **get filename** or **put filename**, to transfer the desired file. Mail facilities will also be available, again you must know the remote computer's name and the correct signon for the user to whom you want send mail.

ELECTRONIC MAIL EXCHANGE USING CSO COMPUTER SYSTEMS

Debbie Hudson
Dan Theriault

Each CSO computer system has available an electronic mail ("email") utility which allows you to exchange email with other users on that system. Advances in the area of computer networking have made available the exchange of email among users across a wide range of computer systems, both throughout the University and with non-University sites.

In order to exchange email with persons on other systems, you must know the receiver's email address and should supply your own return address. At this time, there is no "email address directory" available for you to reference; this information must be exchanged personally at the initial exchange.

To exchange email across non-University computer systems, you must know a third piece of information: The name of the computer network which is accessible to the receiver's system. CSO systems can exchange email across the following computer networks: BITNET, ARPANET, CSNET and USENET/uucp. If the receiver's system does not have access to one of these networks, email cannot be exchanged.

The information in this article assumes knowledge of the email utility on the CSO system that you use regularly. In order to make this article useful to as many CSO computer users as possible, some general terms have been used:

username	The name entered when logging-in to the computer.
host	The name of the computer that you are using to send and read email. This name is identified on all CSO systems just prior to the prompt for your username.
sitename	The name of the host computer that the receiver is using to read email. The sitename may be one word, or several words separated by a period. An atsign always precedes sitename: **@sitename** or **@sitename.name.name.name**
node@sitename	The name of a host computer that receives email via a specific sitename. A percent symbol always precedes node: **%node@sitename**

The distinction between using **@sitename** versus **%node@sitename** is needed only when specifying an address that must include both a host name and the name of the system through which email is delivered to that host. The **%node@sitename** syntax usually is not used when exchanging mail across University of Illinois systems. However, it is used to construct some email addresses when sending email to persons at other universities, and in your return addresses across ARPANET and CSNET.

The information that follows is divided among three categories: Email from the Cyber, Email from IBM/CMS, and Email from UNIX. Each section gives you some general information about sending email to users on other systems, as well as your email return address. The last section, UIUC/UIC Host System Addresses, gives specific addresses for a number of University computer systems.

Email from the Cyber

The system name for the Cyber 175 is UIUCNOSA. To send email from UICUNOSA to a user on any other computer system, you must issue the TELL command from **within** the MESSAGE utility. The syntax of the command is:

WHAT TO DO? tell,username{%node}@sitename

The curly braces indicate that **%node** is an identifier to be included only in certain addresses; the braces themselves are not part of the address.

Your Return Addresses from UIUCNOSA

Although a return address is automatically included on all email that you send, the information might be inadequate for the receiver to construct a valid return address for you. In order to supply complete information, include the following return addresses (for UIUCNOSA users only) at the end of your email message.

BITNET	**username@uiucnosa** **(UIUCNOSA is a BITNET MAIL-ONLY node)**
ARPANET	**username%uiucnosa@a.cs.uiuc.edu**
CSNET	**username%uiucnosa@uiuc.csnet**
USENET/uucp	**[ihnp4,pur-ee,convex]!uiucdcs!uiucuxc!username%uiucnosa**

Substitute your Cyber USERNUMBER for **username** in the above examples. The comment in parentheses following your BITNET return address should be included; it indicates to other BITNET users that "sendfile," "profs" and "rscs" messages are not supported on the UIUCNOSA system. The information enclosed by square brackets in the USENET/uucp example is a convention established at USENET sites to indicate multiple routing options; they should be included on the return address, but are not used when constructing a USENET/uucp email address.

Email from IBM/CMS

CSO provides access to the IBM/CMS operating system on several different computer hosts. The IBM/CMS system names are: UIUCVMB, UIUCVMC, UIUCVMD and UIUCVME. The examples here refer only to the use of the CMS "mail" command, which is one of several different electronic mail utilities available for you to use. At this time, CSO officially supports only the "bitnote" and "note" commands. However, we are in the process of evaluating many IBM email resources, and will announce a recommended and fully-supported version within a few months.

To send email from any IBM/CMS system using the "mail" command to a user on any other computer system, the syntax of the command is:

mail username{%node}@sitename

The curly braces indicate that **%node** is an identifier to be included only in certain addresses; the braces themselves are not part of the address.

IBM "note" users: This command can be used only when sending email to a user at another IBM-VM site. To avoid problems, you should use this command only when exchanging email with persons on the same host system that you are using.

IBM "bitnote" users: This command can be used instead of "mail" when sending mail to full BITNET sites. For non-BITNET sites and BITNET "mail-only" sites, "bitnote" can be used only in conjunction with appropriate entries in your "nickname" file.

For more information about "mail," enter the CMS commands:

LINKTO BITNET
HELP BITNET MAIL

Your Return Addresses from IBM

Although a return address is automatically included on all email that you send, the information might be inadequate for the receiver to construct a valid return address for you. In order to supply complete information, include the following return addresses at the end of your email message.

BITNET	**username@uiucvm{b,c,d,e}**
ARPANET	**username%uiucvm{b,c,d,e}@a.cs.uiuc.edu**
CSNET	**username%uiucvm{b,c,d,e}@uiuc.csnet**
USENET/uucp	**[ihnp4,pur-ee,convex]!uiucdcs!uiucuxc!username%uiucvm{b,c,d,e}**

Substitute your IBM/CMS logon name for **username** in the above examples. The name shown as **uiucvm{b,c,d,e}** should be replaced with the specific name of the IBM/CMS host that you use regularly; the braces themselves are not part of the return address.

The information enclosed by square brackets in the USENET/uucp example is a convention established at USENET sites to indicate multiple routing options; they should be included on the return address, but are not used when constructing a USENET/uucp email address.

Email from UNIX

CSO provides access to the UNIX operating system on several different computer hosts. The UNIX system names are: UIUCUXA, UIUCUXE and UIUCUXF. To send email from any UNIX system to a user on any other computer system, the syntax of the mail command is:

mail username{%node}@sitename

The curly braces indicate that **%node** is an identifier to be included only in certain addresses; the braces themselves are not part of the address.

Your Return Addresses from UNIX

Although a return address is automatically included on all email that you send, the information might be inadequate for the receiver to construct a valid return address for you. In order to supply complete information, include the following return addresses at the end of your email message.

BITNET	**username@uiucux{a,e,f}** **(UIUCUX{a,e,f} is a BITNET MAIL-ONLY node)**
ARPANET	**username%uiucux{a,e,f}@a.cs.uiuc.edu**
CSNET	**username%uiucux{a,e,f}@uiuc.csnet**
USENET/uucp	**[ihnp4,pur-ee,convex]!uiucdcs!uiucuxc!uiucux{a,e,f}!username**

Substitute your UNIX login name for **username** in the above examples. The name shown as **uiucux{a,e,f}** should be replaced with the specific name of the UNIX host that you use regularly; the braces themselves are not part of the return address. The comment in parentheses following your BITNET return address should be included; it indicates to other BITNET users that "sendfile," "profs" and "rscs" messages are not supported on UIUCUX{a,e,f}. The information enclosed by square brackets in the USENET/uucp example is a convention established at USENET sites to indicate multiple routing options; they should be included on the return address, but are not used when constructing a USENET/uucp email address.

UIUC and UIC Host System Addresses

Descriptions and host names of many University (UIUC and UIC) computer systems are listed below. This list will be updated as more University systems become accessible for email exchange. The syntax of the command used to send email to each of these hosts is also provided. Note that the information below is specific only to sending email from a CSO system to other UIUC (Urbana-Champaign campus) and UIC (Chicago campus) systems.

In the following table for UIUC, the departmental abbreviations are: CSO - Computing Services Office; DCS - Computer Science Department; NCSA - National Center for Supercomputer Applications; CSRD - Center for Supercomputer Research and Development; CSL - Coordinated Sciences Lab.; HEPG - High Energy Physics Group.

Host Names at Urbana-Champaign Campus (UIUC)

Department	*Computer - Operating System*	*Host Name*	*Command Syntax*
CSO	Cyber 175 - NOS	uiucnosa	from Cyber: tell,username from IBM: mail username@uiucnosa from UNIX: mail username@uiucnosa
CSO	IBM 4381 - CMS IBM 4341 - CMS IBM 3081 - CMS IBM 4341 - CMS	uiucvmb uiucvmc uiucvmd uiucvme	from Cyber: tell,username@uiucvm{b,c,d,e} from IBM: mail username@uiucvm{b,c,d,e} from UNIX: mail username@uiucvm{b,c,d,e}
CSO	Pyramid - UNIX[1] Sequent - UNIX[1] Pyramid - UNIX[2]	uiucuxa uiucuxf uiucuxe	from Cyber: tell,username@uiucux{a,e,f} from IBM: mail username@uiucux{a,e,f} from UNIX: mail username@uiucux{a,e,f}
DCS	UNIX[3]	uiucdcs	from Cyber: tell,username@uiucdcs.cs.uiuc.edu from IBM: mail username@uiucdcs.cs.uiuc.edu from UNIX: mail username@uiucdcs
NCSA	VAX 11/785 - VMS	ncsavmsa	from Cyber: tell,username@ncsavmsa from IBM: mail username@ncsavmsa from UNIX: mail username@ncsavmsa
CSRD	VAX 11/785 - UNIX	uicsrd	from Cyber: tell,username@uicsrd.csrd.uiuc.edu from IBM: mail username@uiucrsd.csrd.uiuc.edu from UNIX: mail username@uicsrd
	IBM 4381 - CMS	uicsrdvm	from Cyber: tell,username@uicsrdvm.csrd.uiuc.edu from IBM: mail username@uicsrdvm.csrd.uiuc.edu from UNIX: mail username@uicsrdvm.csrd.uiuc.edu
CSL	VAX 11/780 - UNIX[4]	uicsl	from Cyber: tell,username@uicsl.csl.uiuc.edu from IBM: mail username@uicsl.csl.uiuc.edu from UNIX: mail username@uicsl
	VAX 11/780 - UNIX[4]	uicsg	from Cyber: tell,username@uicsg.csl.uiuc.edu from IBM: mail username@uicsg.csl.uiuc.edu from UNIX: mail username@uicsg
HEPG	VAX 11/780 - VMS	uiuchepa	from Cyber: tell,username@uiuchepa from IBM: mail username@uiuchepa from UNIX: mail username@uiuchepa

1. Student machine.
2. Public machine.
3. DCS has several different UNIX systems. Use the host name specified above unless the email receiver has given you another name for a specific DCS host.
4. CSL has several different systems as well as the two listed above. Use one of the host names specified above or the host name specified by the email receiver.

In the following table for UIC, the departmental abbreviations are: ACC - Academic Computing Center; CS/EE - Computer Science/Electrical Engineering; AISS - Administrative Information Systems & Services (Chicago).

Host Names at the Chicago Campus (UIC)

Department	Computer - Operating System	Host Name	Command Syntax
ACC	IBM 3081 - VM	uicvm	from Cyber: tell,username@uicvm from IBM: mail username@uicvm from UNIX: mail username@uicvm
	IBM 3081 - VMS	uicmvsa	from Cyber: tell,username@uicmvsa from IBM: mail username@uicmvsa from UNIX: mail username@uicmvsa
CS/EE	VAX 11/780 - UNIX	uicbert	from Cyber: tell, username%uicbert@uiucuxc from IBM: mail username%uicbert@uiucuxc from UNIX: mail username@uicbert
AISS	IBM 3081 - MVSXA[1]	uicsysm	from Cyber: tell,username@uicsysm from IBM: mail username@uicsysm from UNIX: mail username@uicsysm

1. Because of system requirements, email to uicsysm must not exceed 70 characters per line, nor 70 lines total text per message.

IBM CMS NOTE PROGRAM WILL BE INVOKED BY THE NOTE COMMAND

Greg Kesner

In the early years of CMS on the UIUC campus, modifications were made to the standard IBM CMS NOTE command to have it produce files with the proper format to be handled by the MAILER mail-transfer software which supports both IBM and non-IBM BITNET nodes (e.g., the Cyber computer or other DEC VAXs). Certain functions of the IBM NOTE command were removed or modified without broader approval and, through oversight, were not completely documented. Because it met the immediate need for an electronic mail command that would produce a file which could be sent to any BITNET node, this modified NOTE command was placed on the USEFUL public software disk ahead of the IBM NOTE command in the CMS search order. Hence, each time a CMS user entered the NOTE command, the modified NOTE program was invoked instead of the standard IBM NOTE program documented in the CMS documentation. This was acceptable or unknown to many CMS users, but created problems when someone actually wanted to use the IBM NOTE command because of features not supported in the modified version. It has also been confusing for new CMS users who attempt to learn how to use the IBM NOTE command and then find the modified version does not work as they had been led to expect.

The modified NOTE command was a quickly-produced solution to the need for a mail program which would generate mail files in the format required by the MAILER program. In retrospect, our mistake was that we did not give the modified version a different name from the IBM

NOTE command and properly document it as an alternative to the IBM NOTE command for sending mail files across BITNET. (The IBM NOTE command produces mail files which can be received almost exclusively by other IBM systems.) We now intend to rectify the situation.

On October 15th, the locally modified version of the CMS NOTE command will be removed from the system. From that point on, the NOTE command invoked will be the standard IBM CMS NOTE command. The BITNOTE command will continue to be available and will be placed on the USEFUL disk for easier access. The BITNOTE command is actually a revised version of the locally modified NOTE command which we are recommending as one of several good electronic-mail-file programs available in CMS. Therefore, after October 14th, you are advised to use the IBM CMS NOTE command if you like its features and are sending mail to other IBM systems. These may be identified in the BITNET NODES help file which you may view via the CMS command: HELP BITNET NODES. (Note: You must issue the LINKTO BITNET command prior to issuing the help command.) If you prefer to use one command for electronic mail which will send files successfully to all BITNET nodes, you may use BITNOTE instead of NOTE. If you need to send electronic mail to non-IBM systems, we presently recommend you use BITNOTE.

There are a few other good mail-file programs available which we plan to evaluate in the near future. Some of these programs have great features, but can be somewhat difficult to begin to use. As we continue to evaluate the software available to support electronic mail, we encourage you to tell us your ideas, as well as any leads on other good software. Feel free to contact the consultants or use the local SUGGEST command.

DIFFERENCES BETWEEN SHAZAM VERSION 4.5 AND 5.0

Esther Edwards-Iwe

SHAZAM is an econometrics computer program available on a variety of computer systems. Here at the University of Illinois, Urbana-Champaign campus, SHAZAM is available on the IBM/CMS and the CDC Cyber 175, as well as IBM-compatible microcomputers.

As mentioned in the last issue of *Off-Line*, SHAZAM 4.5 is not upward compatible with V.5.0. As a result, programs written under the old release will not run under Version 5.0. SHAZAM Version 5.0 has been substantially revised and is considerably easier to use and more powerful. Below are highlights of some of the differences between the two versions of SHAZAM. For a detailed list see the users' reference manual. *SHAZAM Users' Reference Manual* is now available for sale at the CSO Distribution Center, 1208 W. Springfield, **not** the Illini Union Bookstore, as previously announced.

1. In SHAZAM Version 4.5, each run is organized into sections, i.e., SOLOMON, HERCULES, ATLAS, ZEUS, ACHILLES and MERCURY. There is no equivalent system of organization in Version 5.0. The new SHAZAM commands are executed as they are given, whereas in the old version, some of the commands were stored before execution.
2. DATA INPUT: Data input is very different in the new SHAZAM. The old SOLOMON command was used to tell SHAZAM how many variables and observations there were in a data file. In the new SHAZAM, the SOLOMON command functions are performed by the SMPL and READ commands. In Version 5.0, the SMPL command is used to specify the sample range and the READ command is used to specify the way the data is to be read and in what format.

3. IO Options: The Hercules section of the old SHAZAM was used to optionally specify any input/output option the user desired. There is no equivalent option in the new SHAZAM. Most IO options are now done with the READ, PRINT, and STAT commands in Version 5.0.

4. VARIABLE NAMES: In the old SHAZAM, the NAME command was used to optionally assign an index number and a name of up to 8 characters to each variable in the data set. There is no NAME command in the new SHAZAM. In the new version, variables are named as they are read in according to the names listed in the READ command.

5. FILE CONTROL: The DATA command of the old SHAZAM provided information on the data format and location. In the new SHAZAM, the function of the DATA command is performed by the READ statement.

6. HH and GS commands: The HH command was used to perform least squares regressions using householder transformations to obtain an exact DURBIN-WATSON test for autocorrelation, while the GS command was used to obtain the GRAM-SCHMIDT regression. These two commands are no longer available in the new SHAZAM. Instead, the METHOD= option specified on the OLS command will yield the same result.

The following options and commands have the same functions but different names in old and new SHAZAM:

Version 4.5	*Version 5.0*
MERCURY	STOP
FM	FORMAT
FO	NOCONSTANT
RE	LIST
GRAPH	PLOT
CR	PCOR
CV	PCOV

ACRITH V.1.0 Release 3.0 INSTALLED ON VMD

(High Accuracy Arithmetic Package)

Esther Edwards-Iwe

We have recently installed a newer version of ACRITH Version 1, Release 3, on the IBM/CMS (VMD) system. The ACRITH package is made up of Fortran-callable subroutines, a macro library for assembler language users, and an Online Training Component (OTC) designed to demonstrate the facilities of ACRITH.

ACRITH can be used to develop and verify the accuracy of numerical algorithms that use vector facility as well as complex numbers. This new release has been extended to include the solution of problems involving complex input data, sparse matrices, and nonlinear equations.

ACRITH Version 1, Release 3, contains many enhancements which include:

1. Complex extensions
2. Standard functions
3. Complex zeros of polynomials with complex coefficients
4. Complex vector and matrix operations
5. Linear system solver for complex matrices
6. Nonlinear system solver for systems of nonlinear equations

ACRITH Release 3.0 can be accessed on the IBM by entering

```
LINKTO ACRITH (F
```

This makes available a minidisk containing the ACRITH subroutine library, a macro library for assembly language users and various programs used by the On-line Training Component (OTC).

Following this, you would compile and run a Fortran program which calls ACRITH routines. ACRITH is described in detail in the manual, *High Accuracy Arithmetic Subroutine Library, Program Description and User's Guide*, Publication Number SC33-6164-1. This manual is available for inspection at the Systems Consulting Office, 1208 W. Springfield. Also, help files are available online by entering

```
HELP CSO ACRITH
```

To use the Online Training Component, enter the following commands

```
LINKTO ACRITH (F
ACRITH
```

This runs an interactive menu-driven program which allows you to select different features of ACRITH to be demonstrated. (Note: The Online Training Component is only available from a full-screen mode terminal.)

CREATING SPSS-X FILES FROM SAS FILES

Joan Mills

PROC TOSPSS, an SAS procedure, has been installed on the VMD machine to produce SPSS-X system or portable files from SAS workfiles or datasets. This procedure, provided by SPSS, Inc., was installed in SAS and must be invoked from a SAS program on VMD. The procedure produces an output file on VMD disk. This file has the data, the variable names, the missing values (as SPSS-X system missing values), the modes of the data (numeric or string), the labels and formats (if available) of the data from the input file ready for use in an SPSS-X program. The user may choose system file or portable file form (the latter generally suitable for carrying to a different computer system). If a system file form is chosen, it may be compressed or noncompressed (compression saves disk space at the expense of processing time for reconstruction when run).

The following is a simple example of the usage of PROC TOSPSS:

In a SAS program file:

```
CMS FILEDEF two DISK fn ft fm;
DATA one; INPUT varlist; CARDS;

data lines

;;;;
PROC TOSPSS DATA=one OUTPUT=SYSTEM SPSSFILE=two;
```

In an SPSS-X program file:

```
FILE HANDLE two/NAME='fn ft fm'
GET FILE=two
CONDESCRIPTIVE ALL
```

The SAS program is run first; producing an SPSS-X system file from the SAS file specified with name one in the example and placing this file, using the SPSSFILE parameter, at ddname two. Note that ddname two also appears on a CMS FILEDEF statement in the SAS program. The FILEDEF specifies a complete CMS file identifier (fn ft fm) for the SPSS-X system file output. By default the example program produces a compressed system file. To prevent this, the parameter NOCOMPRESSION must be added to the list of parameters on the PROC TOSPSS statement.

Since raw data could easily be read directly into SPSS-X, a more probable SAS program for using PROC TOSPSS would involve a SAS dataset or library. If this were the case, the SAS program might be as follows:

In SAS:

```
CMS FILEDEF two DISK fn ft fm;
PROC TOSPSS DATA=old.one OUTPUT=SYSTEM SPSSFILE=two;
```

Here the previously prepared SAS dataset or library member is accessed from the user's disk and converted to an SPSS-X system file. The SPSS-X program given above would work for either SAS example. If the SPSS-X program is run immediately after the SAS program, the FILEDEF statement remains in effect and there is no need for the FILE HANDLE in the SPSS-X program if the file identifier and ddname remain the same.

A document called SASPORT LISTING is available on the SPSS-X disk after LINKTO SPSSX which explains all the available parameters for PROC TOSPSS and other information. More information is available in a file called SASPORT LISTING on the SSPS-X disk (the disk is accessed via the LINKTO SPSSX command).

SPSS/PC+ FOR THE IBM PC AND COMPATIBLES

Anup Roy

The SPSS/PC+ statistical software package from SPSS, Inc. is a group of products designed to organize/enter, analyze and display data in a relatively simple and convenient way. It can

accomplish large file manipulation tasks such as matching, merging and condensing; everyday data manipulation tasks such as recoding, transforming, sampling and weighting; and state-of-the-art statistical analyses. Nearly all of the descriptive statistics, cross-tabulation, analysis of variance, t-tests, correlation and regression statistical procedures used in standard analytical research are included in SPSS/PC+ and its components. Most advanced multivariate techniques like discriminant, factor, cluster and hierarchical log-linear analyses as well as multivariate analysis of variance & covariance are supplied in the so-called "Advanced Statistics" module.

The SPSS/PC+ report generator provides flexible formatting for producing documents. SPSS/PC+ Graphics featuring Microsoft Chart and SPSS/PC+ Tables make presentation-quality graphs and tables from data files.

A newly released Data Entry option and file translation procedure in the base system facilitate the creation of SPSS/PC+ system (binary) files.

SPSS/PC+ runs on an IBM PC/XT or AT (or many of the IBM compatible microcomputers such as the AT&T 6300 Plus, Compaq 286 Deskpro, ITT Xtra, Leading Edge, NCR PC8, Sperry IT, Wyse 1100-2, and Zenith 241, etc.) with at least 384K available RAM (some procedures like Manova and Tables require at least 448K); a 10 megabyte hard disk (although at least 20 is recommended for the complete installation); a 5 1/4" 320/360 KB double-sided double-density floppy disk drive (or an appropriate high density 1.2 MB drive); an applicable math coprocessor (8027/80287) — optional but very strongly recommended; PC DOS (or MS DOS) Version 2.0 or higher; and either an IBM Enhanced Graphics Adapter (EGA) or an IBM Color/Graphics Monitor Adapter, or a Hercules graphics card (for the graphics features).

SPSS/PC+ comes with an excellent full-screen editor/display manager called REVIEW, which can be used to build, browse and edit datasets and execute jobs in an interactive environment. One can, of course, also do batch processing. With Review, one can edit command files while viewing the pertinent output through a separate window on the same screen.

Procedures are provided for transfer of raw data or SPSS-X and portable SAS system files (binary datasets) to and from linked mainframe computers. The communications and file transfer utility, Kermit, is provided free with the product for this purpose.

SPSS/PC+ allows processing of datasets containing up to 200 variables. The number of cases permitted is limited only by the amount of disk space and memory on one's machine. SPSS/PC+ can also read or write ASCII files, enabling one to interface with PC packages such as Lotus 1-2-3, dBase III, Multiplan, or Wordstar.

The basic components of SPSS/PC+ are as follows:

- SPSS/PC+ Base Product — The base system containing all data and file- handling routines; basic descriptive statistics; t-test; oneway analysis of variance (including multiple comparison tests); correlation and regression procedures; non-parametric statistics; and report writing and preliminary plotting functions.

- SPSS/PC+ Advanced Statistics — Advanced statistical procedures such as: factor, cluster, discriminant, and hierarchical log-linear analyses; multivariate analysis of variance and covariance (including repeated measures designs).

- SPSS/PC+ Tables — A supplement to the data display and analysis capabilities, it provides the means to display results of analyses or to summarize data in a tabular form. The output is publication quality and can be directed to a wide variety of printers, including laser printers.

- SPSS/PC+ Graphics featuring Microsoft Chart — With two main components, Microsoft Chart and SPSS' Graph procedure, SPSS/PC+ Graphics provides the ability to summarize and display data using presentation-quality graphics. One can create charts quickly and easily, insert text wherever one wants, customize charts right on the screen, and produce top quality output that is compatible with a wide variety of printers (both dot-matrix and laser) and plotters, as well as with several high-resolution film recorders and video-display devices.

- SPSS/PC+ Data Entry — A set of file creation facilities and new improved file translation procedures, this has been recently added to the SPSS/PC+ series of products as an option. The full-screen, high resolution forms that may be created with Data Entry simplify the process of entering data and creating new data files, especially for someone unfamiliar with both computers and the data. The ability to translate quickly Lotus 1-2-3, Symphony, Multiplan, Wordstar, and dBase II & dBase III files into SPSS/PC+ system files brings powerful data-analytic tools to bear on practically all types of data stored on personal computers.

  Data entry forms may be made to resemble the actual document on which the information has been recorded to reduce confusion and to make it straightforward for clerical staff to enter and edit data. As each field is filled on the screen, the cursor advances automatically on to the next field, precluding the "spacing" errors extremely common to data entry.

  Validity constraints may be imposed on any field to protect the data file from aberrant or errant values — both single-column and cross-column contingency checks (e.g., no "pregnant males") may be performed. After requesting that Data Entry "clean" the data, the user is presented with a report telling which cases do not meet the constraints and hence should be edited. The complete integration of Data Entry with other parts of the SPSS/PC+ system allows one to inspect and edit datasets at any moment during the analysis or the preparation of reports.

Summarized below are more details regarding SPSS/PC+.

Programs Available

SPSS/PC+ Base Product

I. Categorical & descriptive statistical procedures:

DESCRIPTIVES	Computes summary statistics on numeric variables (nearly identical to "Condescriptive" procedure in mainframe SPSS-X).
FREQUENCIES	Calculates summary statistics and displays frequency distributions on a single variable at a time.
CROSSTABS	N-way crosstabulation (contingency tables) and related calculation of various measures of association.

2. Procedures that compare groups:

MEANS	Describes subpopulations by calculating means, standard deviations, sums, etc. across groups of independent variables.
ANOVA	Factorial analysis of variance & covariance for relatively simple designs.
ONEWAY	Performs one-way analysis of variance and sundry multiple comparison tests, etc.
T-TEST	Performs independent as well as paired-sample t-tests.

3. Multi-variable statistical procedures:

CORRELATION	Computes Pearson product-moment correlations for a set of variables.
REGRESSION	Sophisticated multiple regression program with extremely powerful regression diagnostics.

4. Non-parametric statistical procedures:

NPAR TESTS	Performs various non-parametric tests, including one- sample tests, and 2-sample or k-sample (in general) tests for related or independent samples.

5. Data display procedures:

REPORT	Complete and flexible report-writer procedure.
PLOT	Draws bivariate scattergrams, contour plots, overlay plots and regression plots.

6. Data and file management procedures:

JOIN	Matches and merges the contents of multiple SPSS system files in a variety of ways, including addition of cases, parallel or non-parallel matches, and table lookups.
AGGREGATE	Creates system files with cases containing summary statistics for groups of cases for use in later analyses using other programs and/or procedures.
REVIEW	A full-screen editor and display manager to build, browse, and edit SPSS datasets and/or execute jobs in an interactive environment.
Miscellaneous procedures & commands	Supplied for mainframe-micro link to send or receive data files, SPSS-X system-files or portable SAS datasets (Kermit is used as

the file-transfer protocol to transfer SPSS-X or SPSS/PC+ system files); or to exchange data files with other PC software packages, e.g., editors (like Wordstar), spreadsheet programs (such as Lotus 1-2-3), and PC database management system software (like dBase II or dBase III), etc.

SPSS/PC+ Advanced Statistics

FACTOR	Performs various kinds of factor & principal component analyses with a wide array of extraction and rotation methods.
QUICK CLUSTER	Hierarchical cluster analysis method for faster convergence, when the number of clusters is predetermined or prespecified (used for initial screening).
DSCRIMINANT	Performs discriminant analyses with cross-validation, etc.
MANOVA	Performs general model multivariate (and univariate) analysis of variance and covariance.
HILOGLINEAR	Used for hierarchical log-linear modeling for multiway contingency tables.

SPSS/PC+ Tables

TABLES	An additional product used for customizing and producing publication-quality tables for a wide variety of dot- matrix and laser printers, etc.

SPSS/PC+ Graphics — featuring Microsoft Chart

GRAPH	Allows one to summarize and display data using presentation-quality graphics. The SPSS/PC+ Graph procedure is designed to be used primarily with the Microsoft Chart product. However, it can also be used in conjunction with Chartmaster (from Decision Resources, Inc.) and GrafTalk (from the Redding Group).

SPSS/PC+ Data Entry Option & File Translation Facility

Data Entry	An additional product used for customizing data entry and for data "cleaning," it also provides for easy transfer of data from other PC packages into an SPSS/PC+ systems file.

Program Documentation:

1. SPSS Inc. & Marija A. Norusis, *SPSS/PC+ for the IBM PC/XT/AT* (1986). SPSS Inc., Chicago, Illinois. ($29.95)
2. SPSS Inc. & Marija A. Norusis, *Advanced Statistics: SPSS/PC+ for the IBM PC/XT/AT* (1986). SPSS Inc., Chicago, Illinois. ($19.95)
3. SPSS Inc., *SPSS/PC+ TABLES for the IBM PC/XT/AT* (1986). SPSS Inc., Chicago, Illinois. ($14.95)
4. SPSS Inc., *SPSS/PC+ GRAPHICS for the IBM PC/XT/AT* (1986). SPSS Inc., Chicago, Illinois. ($4.95)

SITE LICENSING ARRANGEMENT FOR SPSS/PC+

Anup Roy

SPSS Inc. has recently distributed SPSS/PC+ for the IBM personal computer and compatibles on a site-license basis. The University has made arrangements for a site license on two products: SPSS/PC+ Base Product and SPSS/PC+ Advanced Statistics. Please refer to the accompanying article, SPSS/PC+ for the IBM PC and Compatibles, to familiarize yourself with SPSS software for the IBM PC.

SPSS/PC+ needs to be installed from diskettes onto the hard disk before use. A 10 megabyte hard disk is generally adequate for installing and running SPSS/PC+ on an IBM PC/XT or AT (or compatible).

CSO has purchased a site license for making up to 2,000 copies of these products. Users will have to sign an end-user agreement with the University of Illinois at Urbana-Champaign, and they will have to pay an initial fee for each product as well as a yearly renewal fee.

SPSS/PC+ Distribution

In keeping with the License Agreement that the University of Illinois at Urbana-Champaign has entered into with SPSS Inc., an agreement/contract between the University and the end-user has been developed. The end-user agreement will have stipulations for compliance. It will contain a form to be filled out with questions pertaining to hardware specifications and the actual location of the hardware. The end-user agreement can be obtained from the CSO Systems Consulting Office located at 1208 West Springfield Avenue or the CSO Statistical Consulting Office in Room 85 Commerce West. The completed end-user agreement (including both office & home addresses and telephone numbers) should be brought to the CSO Accounting/Distribution Office at 1208 W. Springfield. A photocopy may be made for personal files.

The end-user agreement will serve several purposes. First, it will be a means by which the University can uphold the stipulations in the License Agreement between SPSS Inc. and itself. Secondly, it will aid CSO in keeping accurate records of who has licensed the software. Third, the information will be added to the SPSS/PC+ Users' Mailing List which will be used to inform users about updates, etc.

The Base Product consists of diskettes numbered B1 through B9. The Advanced Statistics product has diskettes numbered A1 through A6. An additional diskette, containing the most recent version of Kermit (Version 2.29), is also distributed with the rest of the software. Kermit serves in the uploading and downloading procedures. The price for obtaining all of this is $125.00, which includes the yearly license fee, copying fee, and the price of the diskettes. The license fee covers free updates. If there are any updates for this version, the user will have to pay for the diskettes and the copying fee if he/she desires to obtain them. The License between SPSS Inc. and the University will be renewed on the 1st of July every year. Similarly, the end-user agreement must also be renewed on each anniversary date (from date of user's purchase) in successive years. The yearly renewal fee is expected to be approximately $ 100.00.

Although SPSS/PC+ documentation may be purchased by anyone, only employees of the University are entitled to "buy" the software. A valid University faculty/staff ID card (along with a valid picture ID) will suffice as proper identification. Please bring these to the office at 1208 W. Springfield, Urbana. Graduate students are allowed to procure the software only if they currently have an appointment of some kind (e.g., Research and/or Teaching Assistantship

or Fellowship, or Academic/Non-Academic Professional status, etc.) at the University, and are able to prove the same. A University Stores Voucher with proper 11-digit University account information (viz., account number and title) can be processed by the people at the CSO Distribution Office. Individuals may also pay by check made out to the University of Illinois. Cash will not be accepted.

The software are licensed, in general, for use on a single machine only. Multiple machine use requires the purchase of multiple copies. The only exception to this stipulation is that home use by **full-time** employees is permitted, provided that the total number of copies in home use does not exceed the total number of copies in use on University premises under the terms and conditions of the pertinent end-user agreement.

Summarized below are prices for the software and documentation available for sale at the CSO Distribution Office:

Product	Price
SPSS/PC+ Base Product & Advanced Statistics (and Kermit Version 2.29) license, diskette and copying fees	$125.00
SPSS/PC+ (SPSS Inc., 1986)	$29.95
SPSS/PC+ Advanced Statistics (SPSS Inc., 1986)	$19.95

SPSS/PC+ Consulting

The members of the CSO Statistical Consulting Group will be able to consult on SPSS programming techniques and statistical procedures. They will know how to install SPSS/PC+ on the PC and be able to consult on any questions regarding the installation procedure. They will consult on the uploading and downloading procedures provided by SPSS Inc. They will also be prepared to consult on ways to convert SPSS-X code for the IBM mainframe machine (UIUCVMD) into SPSS/PC+ code and vice-versa. Any and all consulting responsibilities lie with the CSO Statistical Consulting Group. Their office is in Room 85 Commerce West. Their office hours are 9 a.m. to 1 p.m. Mondays and Wednesdays, 9 a.m. to 5 p.m. Tuesdays and Thursdays, and 9 - 11:45 a.m. & 1:15 - 5 p.m. on Fridays. They can be reached by telephone at 333-2170.

Anup Roy will take ultimate responsibility for all issues concerning SPSS for the PC. These issues include, but are not limited to, the following: licensing, copying, distribution, installation, consulting, use and training. All questions and/or problems may be referred to him. His office telephone number is 244-1201 (messages may be left at 244-1257).

SPSS/PC+ Diskette Replacement Policy

If, for any reason, an SPSS/PC+ diskette is deemed defective and hence unusable, a replacement will be made free of charge at the PC Consulting Office in Room 91 Commerce West.

Please bring the defective diskette to Room 91 Commerce West. The PC consultant on duty will replace the defective diskette with a new floppy. The PC Consulting Office hours are 10:00 a.m. to 5:00 p.m. Monday through Friday. The telephone number is 244-0608.

If you have any questions with regard to this policy, please contact the CSO Statistical Consultants in Room 85 Commerce West (333-2170), or Anup Roy at 244-1201 or 244-1257.

SAS/IML AVAILABLE FOR THE IBM PC

Vicky Dingler

SAS Institute has developed an interactive matrix language (IML) that can operate on entire matrices of values. Included in the facility are the most commonly used mathematical and matrix operations. The facility allows user specialized methods that are otherwise not available in the SAS system. It replaces mainframe facility PROC MATIRX.

SAS/IML automatically declares data items and allocates storage for them. Variable dimensions and values are also automatically assigned. SAS and IML options can be changed at any time. A variable's type and size can change with each use. SAS data sets can be opened and closed as often as necessary. Formulas for statistical methods can be written in SAS/IML programs easily. SAS/IML graphics commands allow dynamic displays and interpretation of results. The SAS/IML PRINT command displays the matrices of variables and the LIST command defines the observations with outlying data points.

SAS/IML for the PC may have limitations on machines with 512K. Such operations as opening other display windows (HELP, for example), exiting out to the DOS environment, and including large external files into the program editor may be affected by a lack of sufficient memory. A message to this effect will appear. The default workspace for SAS/IML is 25K. If this much space is not available, SAS/IML repeatedly decreases its allocation request by 2K until a space request is satisfied. The ultimate available space may not be available for the above operations. SAS/IML consists of 3 diskettes and will cost $57.20. It will be available October 1, 1986 at the CSO Distribution Office at 1208 W. Springfield.

NOTE: If you are interested in SAS/IML for the PC, please fill out the questionnaire at the end of this issue and return to CSO.

These features are only some of the features that will be available with SAS/IML. Documentation will be available for SAS/IML at the CSO distribution Office at 1208 W. Springfield. Copies will be made available at several sites for review. Those sites include the CSO South Consulting Office at 85 Commerce West, the CSO North Consulting Office at 1208 W. Springfield, and the Undergraduate Library in the Closed Reserved Section.

SAS USERS GROUP MEETING

7:00 PM, OCTOBER 23, 1986
115 DIGITAL COMPUTER LAB

The fourth SAS Users Group meeting on the UIUC campus will be held on October 23rd, from 7:00 pm to 9:30 pm in room 115 DCL. Greg Kesner, the CSO South site manager, will present a demonstration of the SAS FSP facility. Included in the presentation, will be techniques for using FSEDIT, FSBROWSE and FSCALC.

Charlie Smyth of the College of Medicine will present a demonstration on the various techniques SAS provides for PC to mainframe communication. Included in this presentation will be a discussion of RLINK files, the use of Proc Upload and Proc Download, and RTERM, the terminal emulator.

The SAS Users Group meets each fall and spring semester to give users an opportunity to share applications and experiences. All users are welcome to participate and there is no membership fee. Meetings consist of two presentations on CMS/SAS, PC/SAS or statistics. These meetings provide SAS users a great opportunity to meet people with similar interests and talents, to generate new ideas and to stimulate excellence among SAS users.

If you have any questions, please contact Vicky Dingler, CSO SAS Coordinator, CMS userid DINGLER, CYBER user number DINGLER, telephone number 333-4668. Hope to see you at this meeting!

APPLE NEWS

Bob Penka

With a combination of private and institutional purchases and grants to the University by Apple Computer, Macintosh computers are building a recognizable presence on campus.

Apple Computer recently donated to the University 50 Macintosh Plus computers and supporting printers and disk drives. Under terms of the grant, the University must purchase an equivalent amount of hardware for a total of 100 systems to be used in instruction and research.

During the time Apple had this grant under consideration, members of the campus continued to send them individual grant proposals. Apple postponed consideration of these requests pending a decision on a larger campus grant. Once it was approved, Apple returned the individual requests to us and asked that they be funded through the campus award.

Because 31 of the granted computers were absorbed by individual requests previously sent to Apple and 50 by a planned student Macintosh site, there was no formal announcement and solicitation of proposals. The student site is part of the CSO facility in the Mechanical Engineering building and is used by beginning Computer Science students. Eight individuals were awarded equipment.

Apple has agreed to enlarge the grant but its ultimate size and the timing of delivery of the equipment is still being discussed. Once these details are settled, a method for submitting and judging proposals will be established and announced. We are hoping for a sufficiently large commitment to warrant a campus-wide solicitation of proposals.

In addition to the equipment above, Apple has made a significant donation to the School of Humanities and the Department of Sociology. As part of a grant/purchase arrangement, the School of Humanities has acquired 122 Macintosh Plus systems with supporting printers, disks, and modems; the Department of Sociology has obtained 30 systems. Both units will award equipment to faculty members in the respective units.

In a separate action, the Division of Housing has purchased 50 Macintosh Plus systems, to be added to 50 previously granted by Apple. These 50 systems are being deployed in clusters for shared use by residents of campus student housing. Fifteen of the systems will be deployed at each of the CSO service sites in the Illinois Street Residence Halls and the Florida Avenue Residence Halls.

PC SOFTWARE PRICING

Jack Knott

During the past few years CSO has been able to obtain software at reduced prices for educational use (educational use is defined as being used in a classroom environment). Copies for administrative or personal use are available, but at a higher price.

Software that falls into this category includes:

Volkswriter 3	$75.00 - minimum order of 6
Word	$180.00 - minimum order of 10
DBase III plus	$200.00 - no minimum order
Rbase 5000	$99.00 - minimum order of 6
Lotus 1 2 3	$198.00 - minimum order of 6
Borland Products	80% discount for review examination copies.

In addition, CSO has made arrangements with several software vendors enabling us to resell some software at a much reduced price. The price reductions were made possible in one of two ways; by agreeing to purchase a minimum number of copies of the software, or by paying a licensing fee up-front. The following may be purchased at the CSO Accounting/Distribution Office, 1208 W. Springfield Ave. Urbana.

SAS	$63.80 - BASE product; $40.50 - STAT product $19.25 - RTERM product
SPSS	$125.00 - includes Base Product and Advanced Statistics only
Notebook/Bibliography	$25.00
SHAZAM	$50.00

The Notebook/Bibliography package has the documentation included; however, the documentation for SAS, SPSS and SHAZAM is not included in the above price.

The TenCORE Authoring Language, a software tool for developing computer-based instruction on the PC, is available through the Office for Information Management, College of Commerce (for more information go to 307 Engineering Hall; telephone 333-3370). Prices are:

TenCORE Authoring Language	$190
Maintenance agreement (updates of program and manuals for one year)	$190
TenCORE network version	$6,175
Maintenance agreement - network version	$1,900

PCWrite documentation has been obtained at a bulk purchase price; the costs are:

Softcover copy	$13.00
Hardcover copy	$16.50

This price does not include the PCWrite software. The software is public domain and can be obtained in Room 70 Commerce West. The purchase of the documentation includes a software user fee.

If you have suggestions about software that would be advantageous to purchase in bulk (high usage), please let me know and efforts will be made to obtain the best possible price.

If your department has been successful with vendors on the purchase of software, please let me know. It is to the advantage of the University to procure software at the best possible price and to let others know. If you have any license agreements with various vendors, we would be interested in knowing what arrangements have been made and if other areas of the University can share the good fortunes of a price break.

CSO has a reasonable amount of public domain software available in Room 70 Commerce West. Please feel free to contact my office for any information you may wish. Phone 333-6562 and leave a message.

CSO PERSONAL COMPUTER REPAIR CENTER POLICY

Larry Crotser

CSO PC MAINTENANCE ELIGIBILITY

All IBM and Macintosh PCs which were purchased, or acquired by the University of Illinois through any grant are eligible to be serviced at the CSO PC Repair Center. The Center is not allowed by law to service any PC that is owned by a private individual.

Types of Personal Computers Serviced

At this time, the CSO PC repair facility only services IBM and Macintosh Personal Computers and their selected peripheral devices.

Types of Personal Computer Maintenance Offered

The CSO PC Repair Center offers both on-site and carry-in repair service.

On-site Repair Service: A PC repair person will be dispatched on-site to repair the malfunctioning equipment, or at his or her discretion, take the equipment back to the shop to be repaired, tested, and returned to its original location. The person requesting service must insure that all lock-down or security devices are removed prior to the arrival of the service personnel.

On-site maintenance is only available to those persons who have an on-site maintenance contract with CSO, which includes all IBM PCs that were acquired through the IBM EXCEL grant.

All service requests for on-site maintenance must be called into our dispatcher at 333-0969.

Carry-in PC Maintenance: All other non-contractual departments who wish their PCs repaired may do so by bringing their defective equipment to the CSO PC Repair Center located at 114 Horticulture Field Lab Annex.

The equipment must be left, and will be worked on on a first-come first-serve basis. Waiting at the repair facility while the equipment is being repaired is not recommended. Once the trouble has been corrected, the department will be notified by telephone and may come to the repair center to reclaim their property. The department will be charged an hourly rate of $36 for labor plus the cost of any replacement parts.

Hours of Operation

The hours of operation for the center are as follows:

Monday - Friday	8:30 am - Noon
	1:00 pm - 5:00 pm

The center is closed on all University holidays.

USER TRAINING PROGRAM

Short Courses, Manuals and Training Cassettes
for the CSO Computer Systems
Fall Semester 1986
(October and November courses)

SHORT COURSES

CSO is offering the following noncredit short courses during the Fall semester 1986 to acquaint potential users with our computing systems, facilities and services. (Note: since this issue of *Off-Line* will not be out until the beginning of October, we have published only those courses which will given during October and November.)

Short Course Policy

Please note that:

1. CSO makes a small charge for most short courses. This is due to two factors: (1) There is a need for equipment to support improvement in teaching methods; (2) The volume of short courses has risen to the point where it is a serious drain on consulting staff time, and some compensation in staffing must be made. The income is dedicated to support of the short course program.

2. REGISTRATION IS REQUIRED for all courses except where noted. Registration is accomplished by filling out a SEPARATE copy of the registration form and SEPARATE check or voucher for each registration and sending these documents to CSO in either campus or U.S. mail. Walk-in registrations will be accepted in 162 DCL.

3. If fees are paid by check, each check must be dated as of the FIRST DAY the corresponding class is taught. Other checks will be returned.

4. The registration form is available on-line from a Cyber terminal via:

   TYPE,REGFORM/AS/UN=COURSES

   or you may call 244-1257 and request that one be sent.

5. Each registrant will be sent a confirmation of registration on which the place of meeting is noted. This slip must be taken to all meetings of the class and shown when requested.

6. Refunds of fees will be made only for canceled classes, or upon receipt of an application for refund on or before the day BEFORE the second meeting of the class. There are no refunds for classes that meet only once. Application for a refund must be made in room 162 DCL during normal office hours; no applications will be accepted by telephone. Refunds are made by means of a credit memorandum (good for one year); exceptions will be made only in extremely unusual circumstances and at the discretion of the user training coordinator.

7. A copy of the current (updated) short course listing may be examined on-line via:

   TYPE,COURSES/AS/UN=COURSES.

8. Updates (changes) since the printed short course listing was issued may be examined on-line via:

   TYPE,UPDATES/AS/UN=COURSES.

   This file contains current information on courses and sections that have been newly opened, canceled, filled and closed, etc.

9. CSO reserves the right to cancel courses or sections with insufficient enrollment. All fees paid for these classes will automatically be returned.

10. Tax deduction for educational expenses: Treasury Regulation Section 1:162-5 permits an income tax deduction for educational expenses (such as registration fees) undertaken (1) to maintain or improve skills required in one's employment or other trade or business; or (2) to meet express requirements of an employer or a law imposed as a condition for retention of employment, job status, or rate of compensation.

Questions, comments and suggestions should be addressed to the CSO user training coordinator: Ron Szoke, (217) 333-8630; or TELL,SZOKE from a Cyber terminal; or NOTE SZOKE @ UIUCVMD from a CMS terminal; or electronic mail to **uiucuxc!szoke** from a UNIX USENET terminal.

Short Course Summary: Titles

NOTE: For ease of reference, short courses are now classified into six groups, depending on the computing system addressed:

* Special attention is called to new courses in 1986-87, which are enclosed in asterisks. *

G series: General and Introductory

G10. Orientation to CSO Facilities and Services
G23. Computing for Poets
G31. *Remote Access Data Communications*

Computer Graphics

G61. *Survey of CSO Graphics Facilities*

M series: Microcomputers (Especially the IBM PC)

M15. Basic Concepts in Computer Information Processing
M21. Quick PC
M27. *Communicating with and Networking Microcomputers*
M39. *Using a Documentation Package*
M41. Using a Word Processing Package
M43. Using a Spreadsheet Package
M45. Using a Database Package
M51. *Intermediate PC*
M53. Using a Decision-aiding Package

Computer Graphics

M61. *Introduction to Microcomputer Graphics*
M63. Instructional Use of Computer-controlled Video

Statistical Computing

M73. Using a Statistical Package
M75. Micro Versions of Mainframe Statistical Packages

C series: The CDC Cyber Network Operating System (NOS)

C11. Introduction to the Cyber System: NOS Version 1
C21. Producing a Document with RNF

I series: The IBM VM/CMS System

I23. Introduction to IBM Timesharing: CMS and XEDIT
I25. *Using the Document Composition Facility*
I31. Using BITNET
I33. *Intermediate CMS*
I45. *Introduction to the SPIRES Database Management System*
I51. *Introduction to the VM/SP System Product Interpreter*

Statistical Computing

I72. Introduction to BMDP
I76. Introduction to SPSS-X
I79. Repeated Measures Analysis Using SPSS, SPSS-X, or SAS
I83. Introduction to SAS (Statistical Analysis System)
I85. *Introduction to the SAS FSCALC Spreadsheet*

Statistical Package Graphics

I97. Introduction to SPSS Graphics
I98. Introduction to CMS SAS/GRAPH

U series: The UNIX System

U11. Introduction to the UNIX System
U31. UNIX Text Processing
U41. Intermediate UNIX

X series: Mixed and Other Systems

X25. *Survey of CSO Print Services*

Statistical Computing

X76. *Using SPSS-X with VMBATCH from the Cyber*
X77. *Using SAS with VMBATCH from the Cyber*
X81. *How to Use SHAZAM Version 5*

Short Course Listing

G series: General and Introductory

Computer Graphics

G61. Survey of CSO Graphics Facilities

This class presents an overview of the graphics facilities available on CSO's Cyber and IBM-CMS systems. Samples from the major graphics packages will be presented, along with explanations of (1) what kinds of applications each is best suited for, and (2) their respective weaknesses. The various graphics device drivers will also be introduced as time permits. Prerequisite: G10. Fee: $10.

Oct. 15,16 3pm-4:30pm [Albin]

M series: Microcomputers (especially the IBM PC)

M27. Communicating with and Networking Microcomputers

This class will discuss: connecting a microcomputer to a host mainframe locally and remotely; long distance data communications; standard interface wiring; modems; asynchronous communications and local area networks; file transfer between microcomputers and the software available for accomplishing this (emphasizing Kermit). Prerequisite: M15 and M21 or equivalent knowledge of microcomputer fundamentals. Fee: $15.

Nov. 11,13 4pm-6pm [German and Zinzow]

M39. Using a Documentation Package: Notebook II and Bibliography

This class shows how to construct and maintain a text database using a notetaking program and how to generate a bibliography from the database using a bibliography management program. Together, these features provide "database management for

unlimited text." The example package is supported by CSO and available from CSO at a large discount. Prerequisite: M21 or equivalent. Fee: $35 (includes the software package and manual). Enrollment limited to 12 per section.

Oct. 13,14,15,16 12N-1pm [DeWan]

M41. Using a Word Processing Package

How to use a microcomputer (the IBM PC) and word processing package to produce (create, revise and print) publication-ready manuscripts. Prerequisite: M21 or consent of instructor. Enrollment limited to 12 per section. Fee: $25 (includes one diskette).

Volkswriter Oct. 20,22,24 3pm-5pm [Szoke]

M43. Using a Spreadsheet Package

"Electronic spreadsheet" packages (such as VisiCalc, its successors and spinoffs) are widely considered the most impressive and useful software available for microcomputers. This course introduces participants to the analytical and "what if --" capabilities of a new generation spreadsheet package, Lotus 1-2-3 on the IBM PC. Also, glimpses of this package's database and graphics features if time permits. Prerequisite: M21 or equivalent. Enrollment limited to 15. Fee: $25 (includes one diskette).

Oct. 27,29,31 3pm-5pm [Szoke]

M45. Using a Database Package

An introduction to microcomputer database management emphasizing the fundamentals of using database software. Using a leading database package, we will design and create an information file, enter, select and sort data, and use the package to write a report. If time permits, we may also write and run a simple program file. Prerequisite: M21 or equivalent. Enrollment limited to 15. Fee: $25 (includes one diskette).

R:base 5000 Oct. 13,15,17 3pm-5pm [Szoke]

dBASE III Nov. 10,12,14 3pm-5pm [Albin]

M51. Intermediate PC

This is a second course in using the IBM PC/XT/AT and PC-DOS. It covers aspects of DOS 2.x and 3.x not covered in the introductory course (M21: Quick PC). Topics include: the EDLIN line editor, device names, global filename characters, tree-structured directories, pipes and filters, batch files, and configuring your system. Other topics that may be covered as time permits: hard disk usage, batch file commands, the LINK and DEBUG utilities, and using compilers (BASIC, Fortran, Pascal, C). Prerequisite: M21 or equivalent. Fee: $20 (includes one diskette). Enrollment limited to 15 per section.

1. Oct. 6,8,10 3pm-5pm [Szoke]
2. Nov. 17,19,21 3pm-5pm [Szoke]

M53. Using A Decision-aiding Package

This is a non-technical, hands-on introduction to software designed to process (1) a set of goals to be achieved, (2) alternatives to achieving them, and (3) relations between goals and alternatives in order to choose the best alternative (or combination) in light of the goals, alternatives, and relations. There will be special concern for dealing easily with multidimensional goals, missing information, overwhelming alternatives, and conflicting constraints. Prerequisite: none. Enrollment limited to 15 per section. Fee: $15 (includes a diskette containing programs and example data).

Nov. 10,12 12N-2pm [Nagel]

Computer Graphics

M61. Introduction to Microcomputer Graphics

This course surveys the varieties of graphics software and hardware commonly available for microcomputers. Topics include the differences among types of software and what each is best used for, the types of input devices such as mouses and digitizers, and hard copy devices such as plotters and printers. The course is intended for newcomers to graphics who are sorting out what equipment they may need. Prerequisite: M21 or equivalent. Fee: $15.

Nov. 4,6 7pm-9pm [Smyser]

M63. Instructional Use of Computer-controlled Video

This is a one-hour demonstration of a computer-controlled videodisk system for instructional presentations. Some suggestions will be made on how course planners can begin to develop similar technology for the delivery of instruction. Prerequisite: Instructional responsibilities at UIUC. Fee: none.

Nov. 20 4pm-5pm [Smith and Jones]

Statistical Computing

M73. Using a Statistical Package

This course demonstrates how to download a data set from the Cyber system to an IBM PC diskette file. A microcomputer statistical package (probably Microstat) is then used to obtain basic descriptive statistics and do an illustrative regression and analysis of variance. Prerequisites: M21 or equivalent and a good grasp of basic statistical analysis. Enrollment limited to 15 per section. Fee: $30 (includes one diskette).

Nov. 10,12,14 3pm-5pm [Szoke]

M75. Micro Versions of Mainframe Statistical Packages

This is a survey course covering the current state of microcomputer (IBM PC compatible) versions of three popular mainframe statistical packages: SPSS, BMDP and SAS. Issues covered will include, but not be limited to, the following: required hardware configuration and operating system; programs/routines available; comparative

installation procedures; relative pros and cons; current plans for future development. Demonstrations of each package will be given as time and machine availability permit. Prerequisite: M21 or equivalent. Fee: $15.

Nov. 11,13 7pm-9pm [Roy]

C series: The CDC Cyber Network Operating System (NOS)

C11. Introduction to the Cyber System: NOS Version 1

This course is intended for the first time Cyber 175 system user. Covers signing on, obtaining system information, and basic file concepts and maneuvers. The emphasis is on timesharing usage and the ICE text editor. Batch usage may also be discussed. Prerequisite: course G10. Fee: $15. Enrollment limited to 10 per section.

Oct. 20,21,22,23,24 5pm-6pm [Gengler]

C21. Producing a Document with RNF

A general discussion of the broader aspects of document production on the Cyber, including the RNF text formatter, the ICE file editor, dealing with multiple files, thesis office requirements and special packages, and printer selection. Prerequisites: C11 or C12 or equivalent knowledge of the Cyber system and ICE. Fee: $15.

Oct. 6,8 7pm-9pm [Pommert]

I series: The IBM VM/CMS Systems

I23. Introduction to IBM Timesharing: CMS and XEDIT

This course presents an introduction to general CMS (Conversational Monitor System) virtual machine and XEDIT concepts. The CMS portion covers standard and locally written CMS commands and utilities, sending files between the Cybers and CMS, guidelines for utilizing the available documentation, how to use ASCII terminals in full-screen mode. The XEDIT portion introduces the text editor used under CMS. The presentation covers useful commands for both "ASCII typewriter" and "full-screen" or "simulated full-screen" terminals. Recommended prior reading: *CMS Primer*, available at the CSO Distribution Office, 1208 W. Springfield, Urbana. Prerequisite: course G10 or equivalent knowledge. Enrollment limited to 14. Fee: $15.

Sept. 29, Oct. 1,6,8 4pm-6pm [Alster]

Oct. 13,14,15,16,17 4pm-5:30pm [Engelbrecht-Wiggans]

Oct. 27,28,29,30 7pm-8:30pm [Kerr]
two additional hours TBA

Nov. 10,11,12,13 4pm-6pm [Mills]

I25. Using the Document Composition Facility

This course is an introduction to using SCRIPT/VS, a component of IBM's Document Composition Facility, to produce publication-ready documents. The Generalized

Markup Language (GML), which provides a means to describe your document to SCRIPT, is the primary focus of this course. Prerequisite: I23 or equivalent general knowledge of CMS and XEDIT. Fee:$10.

Oct. 6,7,8 5pm-6pm [Gengler]

133. Intermediate CMS

This course is designed for CMS users having at least six months' experience with CMS. Very little introductory CMS material will be reviewed. The course treats in more detail some topics in the introductory CMS course (I23) as well as discussing more advanced topics such as execs, efficient space utilization, an introduction to using magnetic tapes, customizing your CMS work environment, and some commands useful in advanced CMS applications. Enrollment limited to 20. Prerequisite: I23 or equivalent. Fee: $25.

Oct. 20,21,22 3pm-5pm [Kesner]

I45. Introduction to the SPIRES Database Management System

SPIRES is a sophisticated, versatile and powerful database management system that runs on CMS. This course will describe how to build and search a simple database, and will give an overview of additional SPIRES features and a guide to the SPIRES documentation. Prerequisite: I23 or equivalent knowledge. Fee: $10. Enrollment limited to 14.

Nov. 3,5,7 12N-1pm [Wetzel]

I51. Introduction to the VM/SP Product Interpreter

This is an introduction to the System Product Interpreter (SPI) under CMS. SPI is a facility which allows you to write programs comprised of CP, CMS, and/or XEDIT commands using one of three languages: EXEC, EXEC2, or REXX (the Restructured Extended EXecutor language). Using SPI, you can write or tailor your own CMS commands (called "execs") or XEDIT commands (called "macros"). You can also write procedures (called "execs") which accomplish a sequence of repeated tasks by simply entering the name of the exec. This course gives an overview of SPI with primary emphasis on the REXX language. Examples will include creating your own PROFILE EXEC and PROFILE XEDIT files. Recommended references: *The VM/SP System Product Interpreter User's Guide* and the *VM/SP System Product Editor User's Guide*, available at 1208 W. Springfield. Prerequisites: I23 or equivalent. Fee: $25.

Nov. 10,11,12,13 7pm-8:30pm [Kerr]

Statistical Computing

172. Introduction to BMDP for SAS Users

BMDP, a widely-used package of statistical programs developed by UCLA's Department of Biomathematics, is oriented toward the biological, medical, nutritional, agricultural and veterinary sciences. This is an introductory course on the use of BMDP on the IBM system. Topics covered: data preparation, elements of the BMDP language, running BMDP programs at terminals, data editing, creation and use of system files, and examples of using BMDP for descriptive statistics, regression and analysis of

variance. Prerequisite: I23 or consent of instructor. Fee: $25.

Oct. 13,14 7pm-9pm [Roy]
Lab: Oct. 16 7pm-9pm

176. Introduction to SPSS-X (Statistical Package for the Social Sciences)

This course is designed to present the basics of SPSS-X usage. Topics will include file definition, data input, and sample procedure specification. The emphasis of the course will be on the structure and implementation of SPSS-X programs. Examples will be used extensively. Recommended reference: *SPSS-X Introductory Statistics Guide*, available from the CSO Distribution Office, 1208 W. Springfield. Prerequisite: I23 or equivalent. Fee: $25.

Oct. 20,21 4pm-6pm [Mills]
Lab: Oct. 23 4am-6pm

179. Repeated Measures Analysis Using SPSS, SPSS-X or SAS

After a review of concepts and terminology useful for understanding SPSS and SAS documentation for repeated measures analyses, examples are presented step by step with emphasis on the interpretation of output. Guidance is provided on choice of contrasts for answering specific research questions and on presentation and summarization of results. Course describes use of SPSS or SPSS-X MANOVA for repeated measures analysis, followed by a discussion of the new REPEATED option in SAS GLM (Version 5). For comparison, the same data are analyzed using SPSS-X MANOVA and SAS GLM. Prerequisite: Some knowledge of analysis of variance and at least minimal experience using a statistical computer package. Fee: $15.

Nov. 3,5 4pm-6pm [Alster]

183. Introduction to SAS (Statistical Analysis System)

An introduction to SAS processing using the IBM CMS timesharing system. Topics include using SAS interactively and non-interactively, using the DATA and PROC steps, creating temporary and permanent SAS data sets under CMS, reading and writing external data files, using basic SAS procedures, programming in the DATA step, using SAS Display Manager (the SAS Full-Screen Interactive Product) to interactively edit and submit SAS jobs, and an overview of CSO SAS features and services. Recommended references: *SAS Introductory Guide* and the *SAS Companion for the VM/CMS Operating System.* Prerequisite: I23 or equivalent knowledge of CMS and XEDIT. Fee: $20.

Sept. 30, Oct. 2 7pm-9pm [Dingler]
Lab: Oct. 4 10am-11am

185. Introduction to the SAS FSCALC Spreadsheet

The SAS FSCALC procedure provides spreadsheet analytical tools on the IBM mainframe computers under the CMS timesharing system. This course introduces you to the capabilities of FSCALC, including using features of the SAS-like programming language pf FSCALC to define the relationships of spreadsheets rows and columns, processing SAS data sets as spreadsheets, and producing SAS data sets from FSCALC

spreadsheets. Prerequisite: I83 or equivalent knowledge. Fee: $15. Enrollment limited to 20.

Nov. 18,20 4pm-6pm [Kesner]

Statistical Package Graphics

I97. Introduction to SPSS Graphics

Features of the new SPSS interactive graphics product will be reviewed using examples. Step by step, the process for obtaining plots will be explained, using handouts sufficient for participants to reproduce the plots. Pie charts, bar charts, line charts, maps and text will be covered. Prerequisite: I23 or equivalent and familiarity with SPSS. Fee: $10.

Oct. 29 3pm-6pm [Mills]

I98. Introduction to CMS SAS/GRAPH

An introduction to using SAS/GRAPH on the IBM CMS timesharing system with CMS SAS. Topics include: how to use SAS/GRAPH output, global features of SAS/GRAPH, using map data sets, calculating dimensions and proportions for Zeta plots, and highlights of new features in SAS/GRAPH. Prerequisites: I23 and I83 or equivalent knowledge of CMS, XEDIT, and SAS. This course consists of two two-hour lectures. Fee $15.

Oct. 28,30 7pm-9pm [Dingler]

U series: The UNIX System

U31. UNIX Text Processing

This course covers the "command mode" and "insert mode" for both the line-oriented "ex" editor and the screen-oriented "vi" editor. In ex, command structure and addressing along with the most useful editing commands are presented. The basics of vi are discussed along with learning how to physically move through files and around the terminal screen. Use of the nroff and troff text formatters and typesetter is then considered. Prerequisite: U11 or equivalent. Fee: $10. Enrollment limited to 10.

Oct. 20,22 7pm-8:30pm [Edwards-Iwe]

U41. Intermediate UNIX

An explanation of shell concepts is given: redirecting input-output, pipelines, filters, tees, background processing, shell scripts and subshells. Features specific to the C and Bourne shells are covered. The UNIX "make" utility will also be discussed. Prerequisite: U11 or equivalent. Enrollment limited to 10. Fee: $15.

Nov. 3,5 7pm-9pm [Pommert]

X series: Mixed and Other Systems

X25. Survey of CSO Print Services

An overview of how things are printed from the various CSO computers, including special print services such as the Xerox 2700 and IBM 3800 laser printers. Prerequisite: C11 or 123 or U11 or equivalent. Fee: none.

Oct. 2 4pm-6pm [Engelbrecht-Wiggans]

Statistical Computing

X76. Using SPSS-X with VMBATCH from the Cyber

VMBATCH can be used to submit SPSS-X jobs from the Cyber. This presentation will introduce the necessary job control and programming statements for this type of processing. Since VMBATCH is used under the CMS operating system, an explanation of the file naming scheme and disk management techniques will be given. Prerequisite: C11 or equivalent. Fee: none.

Nov. 4 4pm-5pm [Mills]

X77. Using SAS with VMBATCH from the Cyber

VMBATCH can be used to submit SAS jobs from the Cyber. This presentation will introduce the necessary job control and programming statements for this type of processing. Since VMBATCH is used under the CMS operating system, an explanation of the file naming scheme and disk management techniques will be given. Prerequisite: C11 or equivalent. Fee: none.

Oct. 9 4pm-5pm [Dingler]

X81. How to Use SHAZAM Version 5

This course covers how to run the latest release of the SHAZAM econometric and statistical package (Version 5) on the Cyber, IBM-CMS timesharing, VMBATCH, and IBM-PC. Prerequisite: C11 or 123, or equivalent. Fee: $5.

Oct. 7 7pm-9pm [Edwards-Iwe]

MANUALS

The following Cyber manuals are strongly recommended for certain short courses. These documents may be purchased individually at the Illini Union Bookstore (Reference Section), 715 South Wright Street, or may be purchased as a set at the CSO Distribution Office, 1208 W. Springfield.

1. Introduction to the Cyber Systems, $2.00
2. A Tutorial Guide to the ICE Text Editor, $1.25
3. ICE Reference Manual, $3.25

4. RNF Documentation: Tutorial, Macros and Reference, $4.00 (NOTE: This manual is not included in the package; it must be purchased separately.)

5. An Index to Software on the Cyber, $3.25

6. Cyber Fortran Debugging, $1.25

The following (recommended) manuals are also available at 1208 W. Springfield:

CMS Primer, Release 4, $13.00
UNIX User's Manual (2 volumes), $19.00
UNIX Programmer's Manual (2 volumes), $18.00

TRAINING CASSETTES

CSO makes available to the user community nineteen videotape training cassettes: three introducing the Cyber system, six on the fundamentals of using SAS (Statistical Analysis System), and ten on SAS color graphics (SAS/GRAPH). The tapes may be obtained at the Media Desk in the Undergraduate Library (upper level, in back). Show your University ID to the clerk on duty there and state the title of the videotape you wish to use. If a machine is available, you will be taken to a room containing the videotape equipment and shown how to operate it. If all machines are in use you can make a reservation for a later time.

CSO Videotapes

CSO has produced a series of three videotapes (comprising eight segments) which introduce the novice to computing on the Cyber system. A viewing guide containing the major displays in this series is available and can be used to facilitate note taking. Ask for your free copy of the viewing guide when you check out any of these videotapes for viewing.

The title and a brief synopsis of each segment is given below. Running time is 10 to 15 minutes for each segment.

1. **CSOVT1.**
   1.1 Introduction to Computing at CSO: A brief look at the steps required to solve a problem using a computer, and at some of the hardware used.

2. **CSOVT2.**
   2.1 Using a Terminal: A description of the physical operation of a terminal and some of the keys that have a special meaning to the Cyber.

   2.2 Introduction to Cyber Timesharing: A tutorial on logging on and off the Cyber.

   2.3 File Usage: Local files and indirect access to permanent files. An introduction to Cyber files and the commands used to manipulate them.

   2.4 Introduction to ICE Text Editing: A tutorial on entering and modifying files with ICE.

3. **CSOVT3.**
   3.1 Running a Fortran Program: Concepts. A discussion of the concepts of compilation, loading and execution.

3.2 Running a Fortran Program: The PROGRAM statement. A discussion of the PROGRAM statement and its relationship to files accessed by the program.

3.3 Running a Fortran Program: Control Statement. A discussion of the control statements used to compile, load, and execute a Fortran program.

A copy (Beta-1 format) of these videotapes is available for loan from CSO to any instructor wishing to use them in class. They have been effectively used in this environment several times recently, with the instructor stopping the playback equipment whenever he/she wished to elaborate further or questions arose from the class. To borrow a videotape for classroom use and obtain copies of the viewing guide for class distribution, call the CSO training coordinator: Ron Szoke, 333-8630. If you do not already have access to the required videotape equipment, Betamax viewing equipment can be borrowed from the Office of Instructional Resources, 333-3690.

SAS Videotapes

CSO has leased the SAS Basics 100-Series video training course. The course combines video and workbook media to deliver performance-based SAS training. The information in the course is contained in six videotapes.

The videotaped instruction is not complete without the workbook, which contains exercises and illustrations to reinforce the material presented in the videotapes. A copy of the workbook is available for reference at the Media Desk. You may, however, wish to obtain a personal copy of the workbook to complete the exercises, to take notes, and to use as a reference after the course is completed. The workbook may be purchased for $8.00 at the CSO Distribution Center, 1208 West Springfield, Urbana.

NOTE: The SAS videotapes are not available for loan.

The title of each of the videotapes is given below. Running time is about 45 to 60 minutes for each tape.

B101. Introduction to SAS.

B102. Getting Your Data Into a SAS Data Set.

B103. Program Processing.

B104. Working with SAS Data Sets.

B105. Report Writing.

B106. SAS procedures.

A Cyber terminal user may obtain more information about each via:

```
TYPE,SASVID/AS/UN=COURSES.
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The Media Desk also has the ten tapes in the SAS color graphics (SAS/GRAPH) series and a reference copy of the student workbook. For more details:

TYPE,SASGRAF/AS/UN=COURSES.

Audio Cassettes

CSO makes available to the user community three sets of audio cassette tapes for the training of microcomputer users:

1. How to Operate the IBM Personal Computer (on 3 cassettes)
2. How to use MultiMate (3 cassettes)
3. How to use Lotus 1-2-3 (4 cassettes)

These cassettes, with accompanying printed materials, may be borrowed for up to one week by contacting Ron Szoke, 333-8630.

FOR SALE — AB DICK WORD PROCESSOR AND PRINTER

The University of Illinois College of Nursing has an AB Dick Magna-Writer Information Processing System which is approximately 3 years old. Our office has acquired PCs and we would like to sell this equipment to another department who would have a use for it. It is university inventoried. The price is negotiable.

If you have further questions, or are interested in this equipment, please contact the College of Nursing Office, 333-2507.

VISITING RESEARCH PROGRAMMER POSITION AVAILABLE

Social Science Quantitative Laboratory

Visiting Research Programmer, Social Science Quantitative Laboratory. Half-time temporary position, with possibility of change to permanent status. Salary dependent upon qualifications and experience. Duties include providing individual consulting regarding multivariate statistical techniques and complex data management, design instructional exercises, evaluate statistical software for micros and mainframes, manage the SSQL Microcomputer Laboratory, including supervision, coordination of hardware maintenance, and maintenance of micro software. Considerable written and oral communication skills required. Minimum qualifications: M.S. required in statistics or related area (e.g., quantitative area of specialization in social science) and experience and/or course work in computer science. Knowledge of analysis of social science data desired. Starting date: November 6, 1986. Submit resume to Dr. Carolyn White, 210 Lincoln Hall, 702 S. Wright Street, Urbana, Illinois 61801 (217-333-2025). Interviews may be conducted before the closing date, but all applications received by October 17, 1986 will receive full consideration. The University of Illinois is an Affirmative Action/Equal Opportunity Employer.

SAS/IML FOR THE IBM PC INTEREST SURVEY

Name _____

Campus Address _____

Telephone _____

I am interested in using SAS/IML for the IBM PC:

_____Yes _____No

I will use SAS PC Products for the following:

_____Research _____Class _____Other_____

My affiliation with the University is:

_____Faculty _____Staff _____Student Other_____

My PC is a:

_____PC XT _____PC AT _____PC 3270 _____XT/370 _____AT/370 _____Other

If you are interested in using SAS/IML on your PC, please fill out the form above and send it to:

Victoria W. Dingler
CSO SAS Coordinator
150 DCL
1304 W. Springfield
Urbana, IL 61801

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Computing Services Office -- UIUC
Short Course Registration Form, Fall 1986

Note: USE A SEPARATE SHEET FOR EACH COURSE. This form may be copied freely as needed. Fill in all blanks down to the "* * *" and send completed forms to: CSO Short Courses
150 DCL
1304 West Springfield
Urbana, IL 61801

University ID (Social Security) number (9 digits) _____-___-_____

Name: (Please print clearly)
last _____, first _____

Status (circle): Undergrad Grad Faculty Ac staff Non-ac staff Other

Telephone: Work _____ Residence _____

Send receipt to: (address)

_____

_____

_____ CAMPUS MAIL or ZIP _____

Course number	Section number	Course title	Course fee enclosed
_____	_____	_____	$_____

Paid by: (enclose a SEPARATE check or voucher for each course)

_____ Check dated as of the first day of the course, and made payable to the University of Illinois.

_____ University account: Attach a signed STORES / SERVICE Voucher (Form 11-48-8000) credited to CSO, 150 DCL; Account: 1-3-10104-0798, Computer Service. The department, account number (11 digits), and title to be charged must also be filled in. NOTE: "Real money" accounts only; Research Board, SARA, and class accounts are NOT acceptable.

- -

This portion will be returned. You MUST take it to class with you.

Computing Services Office -- UIUC
Short Course Registration Receipt and Admission Slip, Fall 1986

Course Number/Section/Title _____

Last name _____, Initial _____

Date(s) and time: _____

* * *

Meets in room: _____

Validation by registrar:

Date: ____/____/____

RS 08/12/86

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OFF-LINE's Mailing List

If you wish to be placed on our mailing list for future issues of *OFF-LINE*, if you wish to be removed from the list, or if you wish to enter an address correction, please complete and return this page. **(Current subscribers are kept on the mailing list until a specific request for removal is received, or until a mailing is returned as undeliverable.)**

Check one:
- ☐ Place my name on mailing list
- ☐ Make the following corrections or changes
- ☐ Delete my name from mailing list

_____

First name -- Initial -- Last Name

Campus Address:

_____

department

_____

Room - Building

Off-campus Address:

_____

Organization or Company (if applicable)

_____

Street Address

_____

City -- State -- Zip Code

If address correction, give old address and zip code below.

_____

_____

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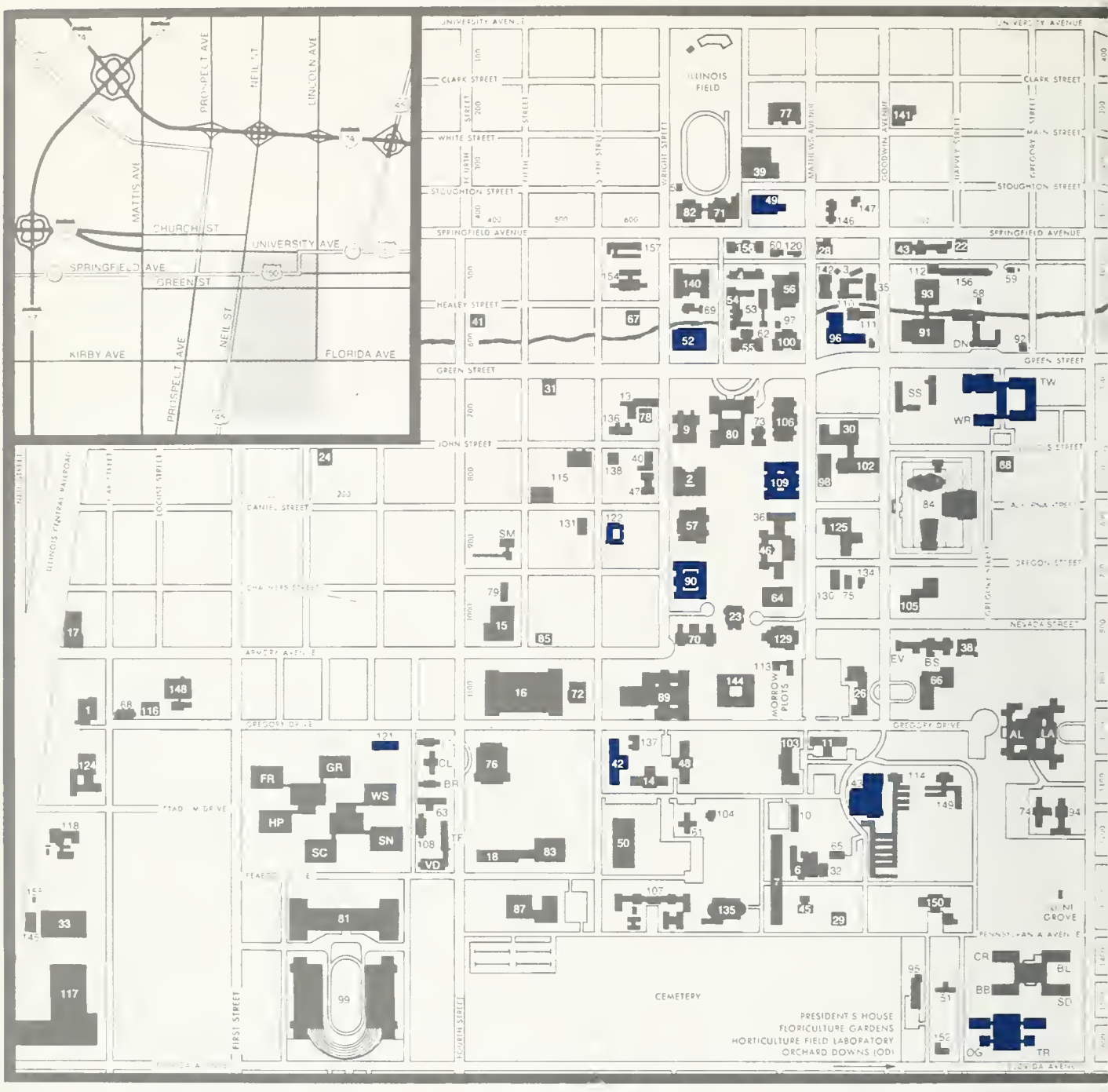
SEND TO:

OFF-LINE
150 Digital Computer Laboratory
University of Illinois at Urbana-Champaign
1304 West Springfield Avenue
Urbana, Illinois 61801

CSO SITES

CSO NORTH (DCL)	
14 Digital Computer Lab 333-7685	Monday-Saturday, 24 hours/day Sunday, 12 noon - 12 midnight
CSO SOUTH	
70 Commerce West 333-4500	Monday-Saturday, 8 am - 12 mid. Sunday, 12 noon - 12 midnight
AGRICULTURE	
N-120 Turner Hall 333-8170	Monday-Thursday, 8 am - 10 pm Friday, 8 am - 5 pm Saturday-Sunday, Closed
CHEMISTRY	
150-154 Noyes Lab 333-1728	Monday-Friday, 9 am - 5 pm Saturday-Sunday, Closed
CRH SNACK BAR	
120 Snack Bar 333-1851	Daily, 12 noon - 12 midnight
ELECTRICAL ENGINEERING	
146 Electrical Engineering 333-4936	Monday-Friday, 8 am - 12 mid. Saturday, 8 am - 5 pm Sunday, Closed
FAR	
Florida Avenue Residence Halls 333-2695	Daily, 12 noon - 12 midnight
ISR	
Illinois Street Residence Halls 333-0307	Daily, 12 noon - 12 midnight
MECHANICAL ENGINEERING	
65 Mechanical Engineering 333-1430	Monday-Saturday, 8 am - 12 mid. Sunday, 12 noon - 12 midnight
PSYCHOLOGY	
453 Psychology 333-7815	Monday-Friday, 8 am - 5 pm Saturday-Sunday, Closed
SOCIAL SCIENCE	
202 Lincoln Hall 333-0309	Monday-Friday, 8 am - 12 mid. Saturday, 10 am - 5 pm Sunday, 12 noon - 5 pm



42 Commerce West
49 Digital Computer Lab
52 Electrical Engineering
90 Lincoln Hall

96 Mechanical Engineering
109 Chemistry - Noyes Lab
121 CRH Snack Bar
122 Psychology

143 Agriculture - Turner Hall
Illinois Street Residence Halls
Florida Avenue Residence Halls

off line

niversity of Illinois at Urbana-Champaign

irector: George Badger
ditor: Lynn Bilger

CSO

omputing Services Office

THE ROLE OF CSO IN CAMPUS MICROCOMPUTER SUPPORT

Bob Penka

Campus ownership of microcomputers has grown rapidly during the past two years. There are now over 5000 systems in use, excluding machines owned by students, and the number continues to grow. Sales of computer equipment by Central Stores last year totaled over $7,000,000. Grants provide hundreds more systems each year.

Studies have been made which attempt to quantify the support needs generated by microcomputers as they are brought into an organization. Various figures are quoted but the ratio of support people to micros is given at between 1:25 and 1:125. These numbers translate into between 10 and 2 person-days per system per year. Support is interpreted broadly, and includes training, consulting, applications development, and maintenance.

Plausible arguments can be made, both pro and con, about the applicability of these numbers to a university campus. However, if the estimates only approximate campus reality one must conclude that support for microcomputers should be decentralized because of the number of people involved. There is evidence of this already happening as departments with ambitious development plans involving microcomputers build their own small support groups. CSO must carefully choose its support mission to maximize its contribution in this environment. We do not want to undertake tasks that can be accomplished better elsewhere.

Three considerations have guided our thinking about our support role for microcomputers. First, CSO should provide support in areas in which we have particular competence because of technical depth or position on campus. Secondly, not every campus unit will be large enough to provide its own support staff. It is reasonable that CSO provide basic support services for these units. Finally, CSO should facilitate internal support by departments for their own special microcomputer needs by providing backup and support for departmental support personnel.

Our thinking has been heavily influenced as well by the kinds of requests for help that we see. Briefly, these are requests for advice in making purchasing decisions, for help with training and applications development, for help with troublesome hardware problems, and for expert advice in areas such as graphics, networking, and system interfacing. Eighty percent of the problems brought to our microcomputer consultants involve communications, word processing, or spreadsheets. The needs represented by these requests are real and are not now being adequately addressed elsewhere.

The microcomputer support role we project for CSO consists of the following:

- Help selecting and acquiring equipment and software. This is a moderately expensive service to provide and one for which demand is small enough that the service should be offered centrally. In offering it CSO capitalizes on its position as a central campus service organization and upon the technical expertise of its staff.
- Basic consulting and training for those units without extensive or unique support needs. We will support packages in common use through a hotline consulting service and training through our regular short course offerings. Customized services will be available for a fee.
- Backup for other support groups on campus. Many of these groups will be small, consisting of one or two people. These individuals will need to draw upon the expertise of a larger group with wider total expertise. We will have on our staff technical experts who are deeply knowledgeable in selected areas such as networking, microcomputer

graphics, and writing programs which interface with the operating system. The basic support mentioned in the previous item also serves to support external support groups.

- We will act as a coordinator, providing mechanisms for information exchange, software purchases and distribution, programmer-employer pairing, and support of user groups.
- We will serve as a campus scout for technology, cooperating with vendors and with others in the campus community to make known new and potentially useful products.
- As the price of microcomputer equipment drops and capabilities increase, services will evolve which should logically be provided within a department. Whenever it makes sense to do so we will develop prototypes of these services so that other units can build on our experience and make informed implementation decisions.
- We will provide maintenance services for selected campus microcomputers

For the past several years CSO has filled part of the role outlined above. We presently provide a microcomputer hotline consulting service 35 hours per week, and offer expert consulting on a number of word processing packages. We offer maintenance for IBM PCs and Macintosh computers, and have arranged site license and bulk purchase agreements for software and documentation. Microcomputer training accounts for 40% of the class hours offered in our training program.

These services have been funded through a combination of reallocation of resources and personnel by CSO and cooperative arrangements with departments. CSO has not received any new funds to provide campus microcomputer support.

CSO was given funds from the EXCEL support budget for six people who provide technical support to EXCEL projects. Project concerns have almost totally occupied their time and few people other than EXCEL participants have so far benefited from their addition to the staff. EXCEL projects however have provided them with valuable experience in areas such as networking, communications, graphics, and database applications, equipping them to eventually serve as campus experts in those areas.

From the start, EXCEL promised to deliver a large number of microcomputers to the campus (1150 have been allocated so far). Because arrival of this large number of systems was known long beforehand, the campus could and did make budget plans for their support.

The thousands of systems coming in from sources other than EXCEL are largely the result of isolated purchase decisions. They have not been factored into the budgeting process as were the EXCEL systems and do not benefit from the same kind of campus support commitment. The support needs of the many people buying and using these microcomputers have grown to the point that they must be addressed. Accordingly, we have made their support one of our major concerns this fiscal year and have reallocated funds internally for a significant expansion of related services. The expanded services are detailed in another article in this issue of *OFF-LINE*.

CSO's involvement in microcomputer support is based on the assumption that microcomputers do not exist in isolation for very long and must be integrated with a wider range of computing and communications services. We expect our services to evolve as the campus needs are better defined and as we see what departments do for themselves. We invite your comments.

EXPANSION Of MICROCOMPUTER SERVICES

Bob Penka

CSO has recently committed to a significant expansion of its support for microcomputers. Expansions will take place in four areas: increased depth and scope of coverage by our microcomputer consulting service, creation of a unit which will provide on-site and custom microcomputer services, creation of a microcomputer resource center, and an expansion in acquisition of site licenses and bulk purchases of software. We are budgeting $100,000 for this program. The entire cost is being covered through an internal reallocation of funds within CSO.

Responding to the increased demand for consulting help and the growing presence on campus of Macintosh computers, we are expanding the hours of operation and coverage of our microcomputer consulting service. In recognition of the expanded nature of this service and its position within a broader total service we have changed its name to the "Microconsulting Hotline."

Our Hotline consultants now offer help with Macintosh computers in addition to IBM PC and compatible systems. Macintosh software supported includes MacWrite, MacPaint, MacDraw, Microsoft WORD, EXCEL, Microsoft FORTRAN, and KERMIT. We welcome your suggestions for additional programs which should be added to the supported list. Jack Knott is in charge of the Hotline service. Call him at 333-6562 with your comments and suggestions.

Hours of service for the Hotline have been extended into the evening. Help is now available between 7PM and 10PM, Monday through Friday in addition to the usual daytime hours of 10AM - 5PM. In response to heavy use of phone consulting, we have installed another phone line and have placed an additional consultant on duty between 10AM and 5PM. Both phone lines are reached by a common number (244-0608.)

In the past we have received requests for help that exceeded the bounds of our Hotline service and standard training programs. We have been asked, for instance, to offer specialized training to small groups of individuals, and have been asked to help solve problems that required a consultant to go to someone's home or office. We have been flexible and have tried to help whenever we could but have seldom had the resources to respond as we would have liked or to officially support such services. We have now created a custom services unit to handle such requests. This unit is managed by Ron Szoke (333-8630), a full time professional with a long involvement with microcomputers and training. He is assisted by a staff of students and is supported by the other professionals on the staff. These professionals have extensive knowledge about word processing, graphics, networked PCs, communications, and database applications.

The Custom Services unit provides on-site training, tutoring, and problem resolution. We are presently supporting Lotus 1-2-3, dBASE II, dBASE III and dBASE III PLUS, R:base 5000, IBM PC BASIC, Turbo Pascal, Kermit, Microsoft Word, Volkswriter Deluxe, PC-Write, Nota Bene, T3, TEX, WATCOM GML, and WordStar 2000. We are willing to entertain requests for support in other areas as well.

Custom services are available at no charge for the first hour. After the first hour time will be billed to recover our labor costs.

We expect that some requests for training and problem resolution will lead us into situations where the real problem is need for applications development. We do not at the present time have a sufficiently large staff to commit ourselves to contract programming. We will, however, help you define your application and help you hire a programmer.

Our third new support initiative is creation of a Microcomputer Resource Center. The Center will be a focal point for individuals seeking information about software and hardware and will provide the coordination needed for software site licenses and bulk purchase arrangements.

For the benefit of the potential hardware or software purchaser the Center will stock a wide range of microcomputer magazines and reference publications useful for finding product reviews and best price and source information. It will contain a software lending library for use by individuals wanting to evaluate competing products before making a purchase decision.

For those looking for low- or no-cost software, the Center will distribute public domain software and Shareware. We have ordered the complete library of public domain software available through PC-SIG and will distribute these products through the Center. The library consists of over 500 diskettes worth of software.

We will buy other reference materials and software which might reasonably be loaned for short periods of time and will work with hardware vendors to make available demonstration equipment.

We plan to have an open house at the Center when a sufficient accumulation of materials builds. We started ordering products for the Center in late October. We expect the Center to be functional in late December .

The Resource Center is located in room 106 CSO Office Building, 101 South Gregory, Urbana. It's a gray, apartment-like structure located 1/2 block south and 1/2 block east of the Astronomy Building.

The Resource Center is under the direction of Mark Zinzow. He is assisted by a student of Library and Information Science who is organizing the wide range of materials for ease of access. Call Mark at 244-1289 with any suggestions you have for the Center.

Finally, we have in the past spent funds for site licenses and bulk purchases of software and documentation, reselling the products at a rate calculated to eventually recover our investment. We will more aggressively pursue such arrangements in the future and have budgeted $15,000 to cover losses associated with the program.

BEWARE IBM PC DIAGNOSTICS!

Rob Smyser

If you have recently moved from an IBM PC/XT to an AT, or have a lab or classroom setting with both XTs and ATs, read the following **very** carefully.

A Diagnostics disk is provided with your computer in its Guide to Operations manual. Some of the programs on this disk set the time and date on ATs and test for hardware failures. You may never use these particular programs after the first day.

However, the disk also contains a program that protects the data on your hard disk from accidental damage when moving your machine between sites. You should use this program whenever you move your PC further than down the hall on the same floor. The program appears on the Diagnostics menu as:

3 - PREPARE SYSTEM FOR MOVING

This option moves the heads of the hard disk to their dedicated "parking space." **This same program will DESTROY the contents of your disk if used on the wrong machine.** What's more, you won't even be able to use the disk again without going through a special reformatting procedure.

Here's the problem. The Diagnostics disk for the PC/XT is labeled "Diagnostics." The disk for the AT is labeled "Diagnostics for the IBM Personal Computer AT." Both have maroon labels and otherwise look identical. It is easy to quite innocently put the XT disk in the AT since it is, after all, labeled "Diagnostics." But if you do use the XT diagnostics disk to prepare an AT for moving, all information on the AT's disk is destroyed and the disk itself is rendered inoperable.

If you have changed from an XT to an AT, make sure you have no plain Diagnostics disks around. If you are using both ATs and XTs, mark a big "XT" on the plain Diagnostics disk.

If you do make such a mistake, there is a way to fix the disk, using a hardware level reformatting program. Contact Rob Smyser at 244-1288 for further information or help.

ANNOUNCING A MICROCAD CONSULTING SERVICE

Rob Smyser

The Microcomputer Support Group of the Computing Services Office would like to announce the formation of a MicroCAD Consulting Service. Rob Smyser, 109 CSOB, will be the consultant to contact for CAD help. Services provided by the office will include the following:

- reviews and evaluations of software and hardware, either provided by vendors directly or loaned from campus units that don't have time to do their own evaluations;
- software support and development in customizing menus, writing macros in AutoLISP, creating and manipulating drawing exchange files;
- coordination of communications among campus units, acting as a clearing house for new products, press releases, writeups, interesting discoveries, etc.;
- in-office or over-the-phone consulting to resolve all kinds of problems including plotting, symbol libraries, macros, etc.

Products supported initially will be Autodesk's AutoCAD, versions 2.18 and 2.5; also Prodesign II. More will be announced as they materialize.

Rob Smyser has had four years experience as an AutoCAD Independent Software Developer. Before joining CSO he taught courses on micro-based CAD for the Department of Landscape Architecture and for Parkland College; he operated the first copy of AutoCAD ever purchased for the U of I. Rob is proficient in several programming languages, including C and BASIC, and is now delving deeply into AutoLISP. Rob has an avid interest in all aspects of microcomputer graphics, but most especially in CAD.

Your ideas for products and activities to support are welcome. Please call Rob with your ideas at 244-1288, or leave a message on the Cyber (ID=029365688) or on UNIX at smyser@uiucuxc and he will get in touch with you.

SOFTWARE PACKAGES AVAILABLE FOR MICROCOMPUTERS

Jack Knott

There is a growing interest in the area of graphics for personal computers. CSO has several packages which have been reviewed and found to be of high quality. Prices listed for the packages are the prices available to departments for classroom/teaching situations.

Software Package	Price
Drawing/Drafting Packages	
AUTOCAD	$500 through the AUTOCAD consortium to UI departments
PRODESIGN	$300
Scientific Graphing, 3D, Surfacing	
GOLDEN GRAPHICS SYSTEM	$300
Graphics Subroutine Libraries	
GSS Graphics Development Toolkit	$399
MULTI HALO	$219
Painting Programs	
DR HALO II	$60
PC PAINTBRUSH	$60

Rob Smyser is our resident expert in the area of graphics for personal computing and he has reviewed the aforementioned packages. He is willing to discuss the capabilities of each package with anyone interested. His telephone number is 244-1288.

We have acquired a University site license for the software package of QUED for use on the Macintosh. This package has been licensed to be run free-of-charge on any University-owned Macintosh that is located on University property (campus). Individual users who wish to use this package off-campus (on home personal computers) may purchase it at the CSO Distribution Center for $20.00. QUED is a multifile/multiwindow editor which can be used for editing text/program files; it is one of the best program editors currently available.

SAS FOR THE IBM PC ENVIRONMENT

Charlie Smyth and Vicky Dingler

Charlie Smyth is Associate Statistician in the Department of Medical Information Science. Vicky Dingler is the CSO SAS Coordinator and a member of the CSO Statistical Consulting group.

As many of you know, SAS for the IBM PC environment has been available for some time. We are becoming increasingly knowledgeable about the product and would welcome additional information or comments about SAS/DOS PC. This article attempts to summarize a variety of information that we have gathered to date.

Hardware requirements are an IBM-compatible PC with DOS 2.1 or better, 512K but preferably 640K RAM, and a hard disk with 10-12 MB of free memory. There are currently three SAS DOS PC products available: Basics, Statistics, and IML. The Basics portion uses 6MB, STATS uses 2MB, and IML uses 1MB of a hard disk. In addition, 4MB of space are recommended by SAS for a work area. A math chip is optional, though recommended.

The PC version of SAS is highly limited by the 640K DOS memory limit. A Vdisk or RAMdisk can be used for SAS .EXE or work files but care is suggested. Appropriate modifications to certain files are necessary. For more information on Vdisks or RAMdisks refer to *SAS Communications*, Summer 1986, pp34-36 (available for reading at the CSO Statistical Consulting Office, 85 Commerce West). SAS seems compatible with various memory-resident software programs such as SIDEKICK or DOSEDIT, but the use of such programs will reduce available memory. How SAS will work with extended or expanded memory specifications and future versions of DOS is unknown at this time.

SAS provides an installation guide with each copy of the SAS software. It is a step-by-step description of how to install the product. A working knowledge of the PC operating system (DOS) is highly recommended. Familiarity with the various commands for manipulating files and working with a fixed or hard disk is necessary (e.g., MKDIR, CHDIR, RMDIR). SAS provides a file called SASLOAD.BAT that uses the DOS RESTORE command to install the Basics portion of the package. This file can be edited if your system does not match the assumed defaults. This file can also be modified to install all products at once if so desired (see step 9 of the installation guide).

SAS has included suggested AUTOEXEC.BAT and CONFIG.SYS files with PATH, BUFFER, and FILE definitions that are not transferred to your hard disk on installation. The commands found in these files need to be combined into any existing AUTOEXEC.BAT or CONFIG.SYS files that you may have. If you do not have these two files, you can copy them from the SAS Base installation diskette. Also, do not forget to reboot your system after installing SAS so that these commands are in effect. If you use a hard disk with a drive letter other than C, you will need to modify the SASLOAD, AUTOEXEC, and CONFIG files appropriately.

SAS places two files, AUTOEXEC.SAS and CONFIG.SAS into the root directory (the root directory is the first or main directory on a hard disk). These files are modifiable and if there is more than one user of the system, you may want to copy them into individual subdirectories (assuming each person is using his or her own subdirectory). By default, SAS will look for these two files within the current directory (the directory from which SAS is called). If the files are not found there, SAS will look in the root directory. These files are also installed as part of the \SAS subdirectory containing the package itself. SAS suggests that user files be kept separate from the \SAS subdirectory since much of the \SAS subdirectory gets purged in any reinstallation of the product (e.g., when updating to a new version).

Unless directed otherwise by the CONFIG.SAS file, SAS creates two subdirectories within the current directory. These subdirectories are called \SASUSER and \SASWORK. By default, SAS will look for these subdirectories in the current directory; if the subdirectories are not found, SAS will define them. Hence, if SAS is called from different directories, \SASWORK and \SASUSER subdirectories will be created in each directory. Files will be left within SASWORK if there is an abnormal termination of SAS. These need to be erased with the DOS ERASE command if they appear in the \SASWORK directory. However, most of the time, the files will be left open and they will not be visible. The open files can be removed by using the /F option of the DOS CHKDSK command.

Appendix A of the BASE product installation guide discusses the options for the CONFIG.SAS file. This file is analogous to the DOS CONFIG.SYS file. One can specify pathways to the various SAS system files. Most of the files that are provided by SAS should remain unchanged. The options for this file are:

−WORK	can be used to direct the location of the SASWORK subdirectory, e.g., to a ram disk or some commonly used area.
−SASUSER	directs the location of the file PROFILE.SFS in the SASUSER subdirectory. This is the file in which the windows, function key definitions and other display manager related items are stored. These may be customized, much as one customizes PROFILE SAS or PROFILE XEDIT on CMS. Like SASWORK, one may want to have these in individual or shared subdirectories.
−USER	lets you direct the location of a default SAS data set subdirectory. None is supplied. This causes all WORK.files to be called USER.files and these are sent to the subdirectory indicated.
−AUTOEXEC	lets you direct the location of the AUTOEXEC.SAS file. Default is to use the file in the current directory. In this file one sets up global options (e.g., OPTIONS PS=21 CENTER; etc.) that one would like to be the default unless overridden in an actual SAS program.
−DMS or −NODMS	specifies Display Manager Session or line-mode session (space saving of 132k). With the −NODMS specification in the CONFIG.SAS file, SAS will be executed in line-mode for the current session. SAS will by default come up as a three-windowed interactive session with "PROGRAM EDITOR," "LOG" and "OUTPUT" windows. The LOG and OUTPUT windows are exactly what they sound like: the log and the listing from various SAS programs. SAS provides a PROGRAM EDITOR, an IBM TSO operating system-like editor, that is not very different from XEDIT under the CMS mainframe system.

A suggested CONFIG.SAS file for using a universal location for \SASWORK and \SASUSER and −USER is as follows:

```
-path \sas\sasexe
-sashelp \sas\sashelp
-msg \sas\sasexe
-work \sas\saswork
-sasuser \sas2\sasuser
-autoexec \sas2\autoexec.sas
-user \sas2\sasdata
```

Lines 1 through 3 are the default and should remain unchanged unless using a RAMdisk. Line 4 directs all SAS temporary work files to a central location. A subdirectory called \SAS2 has

been created that does not conflict with the \SAS subdirectory so that any subsequent updating of the SAS product does not accidentally remove files that should not be erased. Line 5 directs the PROFILE.SFS file to be kept in the \SASUSER subdirectory of \SAS2 while line 6 directs the AUTOEXEC.SAS global options file to be in \SAS2 as well. Finally, line 7 allows for a universal location of files with no first level name to be stored within \SAS2\SASDATA unless otherwise indicated in a SAS program. The first level name defaults to USER instead of the customary WORK name.

Appendix B of the installation guide describes the method used to obtain a copy of the SAS/PC usage notes. We strongly recommend reading these notes because they describe known SAS/PC bugs, explain some features not described elsewhere, and clarify other features briefly mentioned in the regular documentation. Persons who have just recently purchased the SAS/PC software will find a copy of these usage notes included in the package. If you purchased the SAS/PC software before the usage notes were included, you may pick up a copy at 85 Commerce West, or you may obtain a copy from the program itself by entering the following at the PROGRAM EDITOR command line:

```
=====> include '\sas\sasusage\print' <enter>
```

Followed by function key 10, this statement will execute the program that prints the SAS usage notes to the OUTPUT window. When the program has finished executing (5 to 10 minutes) to the OUTPUT window, you may save this document in a DOS file or print it to your printer with **FILE 'USAGENOT.TXT'** or **FILE 'LPT1'**, respectively. (Note that **'PRN:'** would print to the default DOS printer.)

The SAS Program Editor is very similar to the editor in CMS SAS Version 5 with additional commands that take advantage of the PC keyboard (e.g., Del, End keys, cursor keys, defined function keys, pgup, pgdn, ctrl ←, ctrl → keys, ctrl pgup, ctrl pgdn, etc.). The general form for commands is

```
COMMAND [target] option
```

as with the command: FIND string ALL (see for example, page 281 of *SAS Language Guide for Personal Computers*). A subset of the editing commands works in the windows other than the editor window (e.g., FIND). Other windows have additional commands available.

To get DOS ASCII files into the SAS Program Editor, at the command line of the editor type:

```
INCLUDE 'mode:directory filename.ext'
```

A number of commands can be executed with function keys or with <ALT> or <CTRL> combined with other keys. A list of default key definitions is given with the installation guide. For example, the command END gets you out of a window; although no function key is defined as the default, <ALT>E works. NEXT (function key 5) moves you to the next window. Note that some function keys or alt keys are defined differently for a window. Note also that the ZOOM function expands windows. Windows and colors can be defined and saved (see page 273 of the *SAS Language Guide for Personal Computers*). BYE or ENDSAS from any command line will terminate SAS.

The Display Manager in SAS Version 6 is also more extensive than in Version 5. It is possible to use display manager commands within a SAS program with the DM command. There is an extensive Help facility (function key 1) and several other windows. There is a general help menu and specific help for given windows. Other windows include: AF — menu driven SAS; DIR — information about SAS work files; FOOTNOTES, NOTEPAD, TITLES — for defining global footnotes, titles or for a scratch pad; KEYS — lets you look at how the function keys and <ALT> or <CTRL> keys are defined and lets you change them; LIB — displays currently

defined librefs; VAR — information about variables in a SAS data set; and OPT — for seeing and changing various SAS options currently in effect.

The LIBNAME and FILENAME commands are very important.

FILENAME fileref 'filename.ext'; is similar in function to the CMS FILEDEF command and can be used with the command INFILE FILEDEF; to bring in files. %INC 'mode\subdirectory\filename.ext' can be used in place of this combination. The term **fileref** is used analogously to **ddname** of the mainframe version.

LIBNAME libref '\subdirectory\...'; sets up subdirectory access for storing or retrieving SAS data files. Documentation suggests that issuing a LIBNAME for a non-existent subdirectory will create the directory if necessary but this is NOT true. To use a subdirectory, it must already have been created with the DOS MKDIR (or MD) command. For example,

```
LIBNAME test1 'JUNK';
DATA test1.fil1;
INPUT .....;
```

will put this data into a permanent SAS data set called **FIL1.ssd** in the subdirectory \JUNK within the current directory (represented as "."), i.e., as .\JUNK\FIL1.ssd. The current directory could be, for example, \MYSASDIR.

If the subdirectory does not exist, it can be created with the command from the command line, from within the SAS program itself. From the command line, **X 'MD JUNK'** will create the subdirectory .\JUNK. The command **X '\MYSASDIR\JUNK'** will create the subdirectory JUNK within the subdirectory \MYSASDIR. In this latter case, the libref (library reference) would be **LIBNAME test1 '\MYSASDIR\JUNK'** so that it could be accessed from SAS even though SAS is running in a different subdirectory.

It can also be created by exiting SAS temporarily. Use the **X** command (with no parameters) on the program editor window command line. You will be placed into DOS from which you can execute the DOS MD command. Once the directory has been created, use the EXIT command at the DOS prompt to return to SAS.

The AUTOEXEC.SAS file contains SAS statements that define default LIBNAMEs and FILENAMEs, and set general systems options. OPTIONS NODATE NOCENTER;, for example, would prevent the centering of titles and text. The AUTOEXEC.SAS file can contain any valid SAS expression that one would like to be globally in effect unless overridden.

Function keys, <CTRL>, and <ALT> keys can be defined within the KEYS window and stored to the file PROFILE.SFS within the SASUSER subdirectory with a SAVE command within the KEYS window. Changes for a given session can be made but not saved if desired. For further information, see page 300 of the Language Guide.

A DOS window does not exist but the X command issued by itself at the command line gets you out to DOS while EXIT returns you to SAS. SAS warns that the return to SAS should be from within the same directory from which SAS was originally entered. Also, the use of something at the command line like X 'DIR' will clear the screen of SAS and display the DOS directory (of the current directory in this case) until any key is hit at which time SAS will reestablish itself.

SAS/PC allows access to a mainframe SAS session by using RLINK and RSUBMIT. The RLINK procedure lets you use ASYNC, 3270PC, or IRMA3270 emulation to talk with your mainframe. See SAS technical report P-144 for details. RLINK has the ability to use a built in

modem and dial up as well as log you on to a mainframe session. The SAS supplied file CMS.SCR allows manual logon using a 3270PC without modification of the file. However, we have put together suggested files for linkage through a phone modem (using Hayes SmartModem conventions) and through the LocalNet (SYTEK) network. These files may be found on the SAS STATS disk on VMD as RLINKSW SCR and GOSWTCH SCR for access from the switch, and RLINKSY SCR and GOSYTEK SCR for access from LocalNet (SYTEK). (For more information see the article "Using RLINK Files with the Upload and Download Procedures in SAS PC" in the July/August issue of *Off-Line*.) Before using these, it is useful to read about the SAS SIGNON and SIGNOFF commands. Using the RSUBMIT command, one can send a PC-created SAS program to the mainframe given that the used procedures are available on the mainframe version. The LISTING and SASLOG files are automatically returned to the PC session obeying whatever options are in effect for the PC.

PROC UPLOAD and PROC DOWNLOAD provide methods for moving SAS data sets to and from the mainframe across an established mainframe session. These procedures reside on the mainframe though they are called from a PC session using the RSUBMIT command (<ALT><F10>). If you are going to be moving data from/to a PC subdirectory, make sure that you run the appropriate LIBNAME commands from SAS/PC first and make sure that any subdirectories that need to be created, have been. The use of the SAS/PC SUBTOP (for submit top line) command can be useful for uploading and downloading as one can mix a statement that needs to go to the PC first with a program that will actually run on the mainframe. For example:

```
X 'MKDIR \MYSASDIR\JUNK'; LIBNAME in1 '\MYSASDIR\JUNK'; run;
PROC UPLOAD DATA=in1.fil1 OUT=ssdata.fil1;run;
```

The first line should be submitted to the PC while the second line should be "RSUBMITted" to the mainframe. This will upload the file FIL1.ssd to the mainframe as a CMS file known as FIL1 SSDATA A. Note that it really does not matter what one uses in place of **in1** because this is a dummy fileref. SAS will by default write out SAS data sets to the A disk unless a CMS FILEDEF command is given within the program putting the file elsewhere. For downloading files, one uses PROC DOWNLOAD in a similar fashion.

NOTE: There will be times when the connection to the mainframe will be incomplete. There are some techniques to rectify this. First, you can re-issue the SIGNON command from SAS/PC and try the process again. In many cases, a second try will work. If SAS/PC responds with a message that you are already logged on, it will give you the opportunity to log off or try again. At this point, you can either try again or issue the SIGNOFF command to logoff. Second, you can exit from SAS using the X command on the PROGRAM EDITOR command line. Then you can use another PC/mainframe communications package from DOS to connect to the host. This will give you an idea about the status of the mainframe session. You can logoff the mainframe at this point so that you will be able to start again from SAS on the PC.

PROC DIF and PROC DBF to can be used to convert LOTUS 1-2-3 files or DBASE II/III files for use by SAS/PC or mainframe. Note that LOTUS files have to be converted to DIF files first by LOTUS utility routines.

SAS reserves certain file extensions such as .EXE (as with DOS), .MSG for message files, .SSD for SAS data sets, .SFL for SAS format catalogs, .SFS for SAS full screen catalogs, and .SSP for SAS stored programs. SAS recommends that you use .SAS for programs containing SAS statements and .DAT for raw data files.

There is a windowing statement called WINDOW that lets one create new windows for input and output from or to the screen (see page 228 of the Language Guide). It is possible to call

SAS Display Manager commands from within a SAS program with the DM statement (see page 387 of the Language Guide). Also, there is now a way to save compiled SAS statements (see the usage notes).

A HELP file is available on VMD and can be accessed by the command **HELP SAS SASPC**. Currently, the file contains the following:

1) If your PC does not automatically enter the correct date, and you don't enter the date, you will get a message stating that your SAS product has expired.

2) You need DOS on the hard disk, especially the RESTORE command.

3) If you are using MS DOS rel. 3.1, you will only be able to execute the RESTORE command 9 times. Since there are 12 diskettes to the SAS Base product, the installation will proceed through the 9th disk successfully and quit. You need the RESTORE command from an earlier release of MS DOS, or from any release of PC DOS.

4) You can use RLINK with COM2 if you specify OPTIONS REMOTE =ASYNC2; in the GOSWTCH SCR or GOSYTEK SCR RLINK files.

5) The test files in the Base product do not COMPARE correctly. There seems to be no problem in running the procedures, however. It seems that the copying facility at Wordlink put in an extra carriage control character, making the file provided by SAS and the file produced by the user not COMPARE.

6) You can go to the DOS environment from the SAS Program Editor window by typing an X on the command line. To return to SAS, type EXIT in DOS.

Suggestions for additions to this file would be welcome.

ADDITIONAL INFORMATION ABOUT SPSS/PC+

Anup Roy

The following article provides some additional information about SPSS/PC+ for the IBM PC and compatible. This information was inadvertently omitted in the article in the September-October issue of *OFF-LINE*.

It was mentioned in the previous article that the CSO Statistical Consulting group would provide consulting for SPSS/PC+. We neglected to mention that the Social Science Quantitative Laboratory (SSQL) in Lincoln Hall will also provide consulting on SPSS/PC+. The telephone number of SSQL is 333-6751.

One of the basic components of SPSS/PC+ (inadvertently omitted in the previous article) is SPSS/PC+ Mapping, featuring Decision Resources' Map-Master. With two main components, viz., Map-Master from Decision Resources, Inc. and the SPSS/PC+ Map procedure, SPSS/PC+ Mapping provides the ability to produce presentation-quality maps and display them on the same sorts of hard-copy devices that are used with SPSS/PC+ Graphics. This procedure provides full aggregation facilities for summarizing one's data. One can define data values and geographic areas within SPSS/PC+, and then transfer them to Map-Master easily.

Map-Master includes two different types of files:

- Boundary Files which draw the outlines of geographic regions (e.g., countries, states, counties, ZIPs, etc.), and
- Statistics Files containing demographic and economic data for the regions in a Boundary File.

Three Boundary Files are provided with the product: a) world by country, b) western Europe by region, and c) U.S. map by 3-digit zip code.

VERSION 2.2 OF NOTEBOOK/BIBLIOGRAPHY RECEIVED

Ed DeWan

The CSO Distribution Center, 1208 W. Springfield Ave, Urbana, has received Version 2.2 of the Notebook/Bibliography package. Users who have previously purchased the Notebook package, and who wish to obtain an upgrade, must take their original Notebook/Bibliography diskettes to the CSO Distribution Center, where the new programs will be copied onto the original diskettes for you.

The upgrade package contains the following items:

1. diskette containing Version 2.2 of Notebook
2. diskette containing Version 2.2 of Bibliography
3. diskette containing Version 1.2 of Convert
4. Notebook manual supplement
5. Notebook quick reference card
6. 24-page Convert manual

The Convert program is a new addition. It converts records from certain on-line databases to Notebook format, so they can be imported into a Notebook database. It works with most databases in BRS, Dialog II, and to some extent with Knowledge Index.

If you wish to obtain a copy of the Convert program, bring an additional, system-formatted diskette for that purpose (FORMAT B:/S).

Version 2.2 of Notebook includes the following enhancements:

- Marking, Deleting, and Inserting Blocks of Text
- Finding and Selecting on an Entire Record
- Assigning Foreign Characters to the Alt-Function Keys
- Reordering on Foreign Characters
- Finding and Selecting With Foreign Characters
- Underlining Allowed in Custom Report Format
- Maximum Record Size 50000 Bytes

DESKTOP PUBLISHING CONFERENCE REPORT

Ted Hanss

This article by Ted Hanss is being reprinted, with permission, from the 13 October 1986 issue of *U-M Computing News*, published by the University of Michigan Computing Center.

This article describes the major topics discussed at The Desktop Publishing Conference, which was held from 3 to 6 September in San Francisco. Over 900 people attended the conference, sponsored by Seybold Seminars, to hear some of the leaders of the microcomputer industry speak about the latest trends and technological innovations in desktop publishing.

The term "desktop publishing," coined by Paul Brainerd, president of Aldus Corporation and publisher of PageMaker, refers to the growing field of personal publishing. Desktop publishing systems are usually composed of microcomputers, word processing and page composition software, and high resolution printers. What makes these self-contained systems "personal" is their low cost and ease of use, bringing the power of publishing to any microcomputer user. The increasing popularity of desktop publishing is evident from the fact that seven major desktop publishing conferences were held in September. One speaker reported that in the last six months, over 150 magazine articles have been written on the subject.

Steve Jobs, president of NeXT, Inc., cited the technical breakthroughs that made desktop publishing what it is today. These include a "what you see is what you get" (WYSIWYG, pronounced whizzy-wig) computer, the Macintosh, available at about one-tenth the price of its predecessors; a relatively inexpensive, maintenance-free laser printer (the LaserWriter based on the Canon CX engine); PostScript, the page description language used in the LaserWriter; and some innovative applications — MacWrite, MacDraw, and PageMaker.

Impact of Desktop Publishing. Desktop publishing is defining a new standard for written communications. Personal publishing systems have changed the economics of publishing; a large capital investment is no longer needed to become a publisher. As publishing tools are made more affordable, the number of publications will increase. Richard Matthews from Dest, the California scanner manufacturer, stated at the conference that the paperless office and society is a myth.

Desktop publishing allows greater control over publications by authors who no longer have to deal with outside contractors for typesetting and layout. The faster turnaround saves time that would otherwise be spent waiting for layout changes to be delivered by a typesetter. The changes can be seen quickly, either on a graphics display screen or on laser printer output. Gary Billerbeck of Hughes Aircraft said that using desktop publishing technology to produce documentation has resulted in dramatic productivity improvements in his department.

Desktop publishing technology is also affecting how newspapers are produced. The Knight-Ridder newspaper chain uses Macintoshes and modems to distribute graphics between its 29 newspapers. Knight-Ridder is compiling a library of graphics, all in MacDraw format. This is leading to increased productivity and improved graphics. According to Bob Gilbert of the Miami Herald, Macintoshes are being distributed to the newspaper's bureaus so that reporters can submit graphs and drawings electronically.

Major book publishers are also feeling the impact. Steve Bayle of Addison-Wesley reported that over 70% of the manuscripts the company receives are submitted on magnetic media. There are a number of benefits to this trend of delivering manuscripts on disk; for example, re-keying and proofreading costs are reduced. Addison-Wesley has also been accepting

camera-ready, formatted output for five years. This means individual authors can design and print the master copies of their own books. Addison-Wesley has been developing standardized layout and style design packages that authors can use. Bayle believes that desktop publishing opens new markets, making it possible to publish timely books that have a short shelf life.

Defining the Market. The speakers at the conference spent a lot of time attempting to define the desktop publishing market. Some speakers consider desktop publishing merely a fad. Others believe that there will always be a high end and low end to electronic publishing and that desktop publishing will remain a distinct, low-end market.

Steve Jobs believes that while desktop publishing may be perceived as a distinct market today, with its specialized hardware and software, it will eventually become generic technology and will be considered a standard function of future workstations. Jobs believes that within five years, all computers will contain this technology and the "desktop publishing market" will cease to exist. At that time it will be difficult to distinguish word processing from desktop publishing. In the future, basic word processing packages will include all the functions of today's desktop publishing software and specialized hardware such as laser printers and high resolution screens will be standard peripheral devices.

Page Description Languages. Steve Simpson of Hewlett-Packard discussed his company's choice of Imagen's Document Description Language (DDL) for its LaserJet line of laser printers. One reason for the decision is that DDL is a document- versus page-composition language. DDL lends itself well to large multi-page documents, such as 11-by-17 inch pages used in binding or double-sided printing. DDL also complements HP's Printer Command Language (PCL), currently available in the LaserJet line. DDL will be offered as an upgrade to all LaserJet owners.

John Warnock, president of Adobe Systems, talked about his company's product PostScript. PostScript is currently the leading page description language and now faces competition from DDL in establishing an industry standard. Steve Jobs, from his perspective as a workstation manufacturer, believes that PostScript has already won this competition through the tremendous momentum it has gained as a leader in the market. PostScript is currently supported by more than 17 different printers and hundreds of software packages. According to Jobs, Hewlett-Packard made a serious error in choosing DDL. Also, Jobs believes, PostScript will become the de facto imaging standard for both screen and printer. Currently, the Mac uses QuickDraw as its screen imaging model. However, the Macintosh does not perform a smooth conversion from QuickDraw to its printer imaging model of PostScript. What is needed, according to Jobs, is PostScript as the screen driver for future displays.

Laser Printers. Bill Gates, chairman of Microsoft, has conducted research indicating that at a conservative estimate, over 300,000 laser printers have been sold. This is a very large number, considering that laser printers only began to be sold in volume less than two years ago and remain the most expensive type of personal printer available. To meet the increasing demand, forty-seven different companies are making Canon CX engine-based laser printers.

A trend in the laser printer field is a convergence on printing 400 dots per inch (dpi) by the next generation of laser printers. 400 dpi is almost twice the resolution of the current 300 dpi standard (160,000 versus 90,000 dots per square inch). According to Jobs, the current Canon CX engines, if pushed, could go to 600 dpi. However, at 600 dpi the laser printer would require much more memory and a more powerful microprocessor to drive it. While a 300 dpi LaserWriter requires one megabyte of random access memory (RAM) and a 68000 microprocessor, a 600 dpi LaserWriter would require four megabytes of RAM and a microprocessor at least as powerful as the 68020. (While the LaserWriter requires 1 megabyte of RAM, it

includes an extra half megabyte of RAM as additional work space.)

John Warnock stated that a color PostScript printer will be announced in 1987. However, the general consensus was that the color produced by laser printers is best used for presentations, as laser printers are not capable of producing the process colors used by printing presses. A still better presentation device, the speakers agreed, will be the 35mm color slide producer attached as a peripheral to the microcomputer.

David Spencer of Data Recording Systems believes that the use of typesetters will peak at the end of the decade and then decline. In the mid-1990's, when their resolution reaches 800 dpi, laser printers will bypass phototypesetters. Spencer stated that an 800 dpi printer should also be capable of doing 400 dpi for fast draft printing and that a variety of printer resolutions should be available to users.

Demand Printing. Demand printing is the technique of printing complete documents when needed, as compared to the more popular method of printing many copies of a document based on anticipated need. As laser printer technology increases, demand printers must offer high resolution along with high printing speed, high reliability (few paper jams), paper handling facilities such as large input trays, and low cost per page. John Berlaen of the Agfa Gevaert Group discussed the issue of using demand printers versus photocopying documents. For example, the loss of quality by photocopying has to be taken into account — with demand printing each document is an original. Also, there is the loss of time: copying requires a human queue while demand printers have an electronic queue that can be modified. Therefore, he believes, using demand printers reduces the cost of operation. John Gell of Eastman Kodak Company stated that an advantage of demand publishing of manuals is that backup copies are not needed and overruns can be avoided.

Document Preparation Software. Aldus PageMaker is the page layout software package for the Macintosh that sparked the desktop publishing boom. PageMaker sold 30,000 copies in its first year. Desktop publishing is affecting more than just the U.S.; 28% of PageMaker sales are international and the program is published in seven different languages. An MS-DOS version of PageMaker will be released by the end of this year.

Future document preparation software will consist of integrated packages that offer high-powered word processing, graphics, and page layout functions built into the program. This kind of software is currently available, but not on microcomputers. Ragtime, a new page layout package for the Macintosh, has taken a step in this direction with the integration of text editing and spreadsheet functions into the program.

The Macintosh Versus the IBM PC. Which microcomputer family, Macintosh or IBM PC, will become the de facto standard for desktop publishing? This question prompted a great deal of debate. John Page, co-founder of Software Publishing, discussed what he believes to be common perceptions of the Macintosh versus the IBM PC. He thinks that people see the Macintosh as a picture-oriented, fixed and stable platform, with a "right brain" image that appeals to creative users. The IBM PC, on the other hand, is a number-oriented machine with a still evolving graphics environment — an area of uncertainty with all devices — and a "left brain" image that appeals to analytical users.

However, Page and John Meyer, president of Ventura Software, believe that the IBM world will dominate desktop publishing by the end of this decade. Meyer's argument was that with 6,000,000 IBM PC-compatibles available in the U. S., and less than a million Macintoshes, it is inevitable that the PC will eventually lead. Still, Page stated, artistic people with a dedicated application will continue to prefer the Macintosh.

The belief that IBM will establish the desktop publishing standard was strongly refuted by several other speakers. Stewart Alsop, west coast editor for *PC Magazine*, believes that the installed base of PCs and Macintoshes is not sufficient evidence for PC supremacy in desktop publishing. All Macintoshes can be considered desktop publishing machines by virtue of the machine's standard design. On the other hand, Alsop claimed, only 300,000 of the 6,000,000 PCs are configured with the hardware needed for desktop publishing, such as high resolution graphics cards and monitors and powerful microprocessors. This turns the tide of installed desktop publishing machines to the Macintosh's advantage.

Document Distribution. The desktop publishing revolution is changing not just how documents look, but also how they are distributed. Steve Jobs stated that genuine electronic mail will be possible when one can drag a document icon into a "fax icon" that will transparently send the document over telephone lines to the receiver's laser printer and then print it. Fax (facsimile) is an international standard for transferring documents electronically.

As software becomes more capable through the use of artificial intelligence techniques, it will allow users to print a personalized newspaper containing specific topics of interest. This technology is available today in the form of MIT's Community Information Service. However, Andrew Tribute, a computer consultant from England, believes that electronically distributing newspapers takes away the fun of actually reading the paper. He does not always know what he wants in a paper and looks forward to turning each page. Still, as the number of publications increases, creating ways to selectively produce prioritized and personalized publications will become more important.

Effect of Desktop Publishing on Design and Typography. Bill Gates stated that computers print ugly documents. Steve Jobs said that "we started with computer output looking pretty barbarian. Then we invented this desktop publishing stuff and we made it look very barbarian at high resolution." Some speakers claimed that the increased control given desktop publishers will lead to bad design. For example, one person does not often have the skills to write, edit, lay out, and produce graphics for a publication.

Gates does not believe that users are spending too much time formatting memos. He believes that, like any other advance, desktop publishing can be abused, but users will be more efficient when they become accustomed to the technology. There are real benefits to the tools now available. Quality output affects all applications, from word processing to spreadsheets and databases.

The answer to bad design may come in the marketing of specific layout design and style packages, perhaps sold as macro packages with document layout software. These packages will include ready-made definitions for titles, page headings, footnotes, etc. According to Gates, increased use of style packages will reduce the amount of work that the user has to expend to create high-quality documents. Style packages will be integrated into rule-based expert systems that modify layout algorithms using artificial intelligence techniques. These rules will be used to achieve excellent results with the next generation of page layout programs.

Jobs agrees with Gates and hopes that the user will be able to write a very plain looking memo and then import a style package to format it. These styles could also be imported into page layout programs and include some built-in artificial intelligence techniques. More effective publications are needed and style packages will lead to documentation, memos, and news that have greater impact.

Bernard Peuto of Concord Consulting discussed the impact that desktop publishing will have on typography and typesetting. While the typographic industry will continue to expand, there will

be a shift in power in the industry. Large typesetting firms have led in the past, but laser printer manufacturers such as Apple will be the leaders in the future. Peuto predicts that this will not result in a shift in quality.

According to Paul Brainerd, however, the laser printer industry has a poor appreciation of font needs. Apple, for example, did not put Garamond, its corporate font, in the LaserWriter, so the company could not even use its own product. (Garamond is now available as a downloadable font.) Brainerd espouses an open architecture font availability. This would increase the number of available fonts. One hundred proprietary fonts per laser printer is less feasible than 500 fonts available for a variety of printers.

Several of the speakers agreed that typography is an art, while typesetting and producing high resolution output is merely a trade. Brainerd stated that the computing industry has had no regard for characters needed in publishing, such as properly sized dashes and ligatures.

CD ROM Technology. The integration of compact disk read-only memory (CD ROM) into electronic publishing was discussed briefly. CD ROM will be used by publishers of extremely large catalogs and reference documentation, rather than by mainstream publishers. An example would be the large technical manuals published by airplane manufacturers — the combined manuals can weigh more than the plane itself. CD ROM technology will lower costs for updating catalogs and reference manuals and make it easier for users to obtain needed information quickly. It will also make it much less expensive for publishers to distribute information — single disks will be able to hold thousands of pages worth of information. Browsing software will allow users to search the catalog or manual and print out only the selected portion.

Scanners. Richard Matthews from Dest reported that 1,301 scanners were sold in 1985. He estimates that in 1990 almost 58,000 scanners will be purchased, many for desktop publishing. Scanners are used to read in text and graphics, including bitmap graphics, line art, and halftone photographs, from paper. A bitmap is a set of bits or screen pixels that represent the position and state of each dot making up characters and graphics. Text is formed of defined characters that are recognized by the scanner and require 3-4 kilobytes of memory per page of printed text. Bitmap images and halftones take up much more memory, up to 100K or more per page for bitmaps, and one megabyte per page or more for halftones. Scanners able to distinguish gray scales can require up to 8 megabytes of memory per page.

S. C. Lee of Microtek discussed how desktop publishers should justify the purchase of a scanner. Some important uses include simplification of text entry through scanners capable of recognizing individual characters (optical character readers or OCRs); capture of images and manipulation of graphics; archiving of historic documents; image-based database libraries; forms entry and verification; grading aids for school tests; and computer-aided design and drawing.

As the technology improves, scanners are becoming microcomputer peripheral devices instead of dedicated machines. Further advances will include high resolution scanners (400 dpi and beyond) that will be on the market along with comparable resolution printers. (The ability to scan text and graphics at high resolutions is wasted if the text and graphics cannot be printed out at the same resolution.) In the future we will also see gray scale models (65,000 shades or more per pixel); small computer system interfaces (SCSI) and direct memory access (DMA) interfaces for faster input to the microcomputer; higher raw scanning speed (a large scale integration chip currently under development can achieve a scanning speed of up to one second per page); interfaces with facsimile communications equipment and modems; network capability; large, low-cost design and engineering scanning systems; OCRs that read most typefaces in any style or size; better software and hardware integration; and color scanners.

Standards. One of the most widely discussed issues was the topic of standards. Data interchange standards are becoming increasingly important as more users attempt to exchange graphics and text files between different programs. Without standards, desktop publishers may be limited to single-user systems, as there will be no standards for communication. The presence of too many standards creates a problem too, while at the same time there are little or no standards for areas such as scanners and typography.

Centram Systems West President Nat Golhaber stated that standards are achieved through the efforts of a powerful vendor, a powerful customer, standards committees, or through grass roots efforts. He believes that desktop publishing users should begin a grass roots campaign to establish standards in many of the needed areas.

Many of the major companies have representatives on the various standards committees. Current standards efforts concern laser printer drivers, fonts, graphic scanning data formats, data interchange, and character sets. Paul Brainerd is working with others in the industry on graphics and scanning data formats. He has proposed the tag image file format (TIFF) as a standard for graphics interchange.

LANs and Desktop Publishing. Networking and document sharing are critical to desktop publishing. Gusharan Sidhu, who designed the Macintosh local area network (LAN) AppleTalk, and Bob Metcalfe, president of LAN manufacturer 3COM, spoke on the integration of LANs and desktop publishing.

According to Sidhu, if a LAN is designed properly the user should not notice that the network is even there. He believes that for most users, LANs are too expensive, too difficult to set up, and over-engineered. Also, the advantages of using LANs have not been made clear. As printers and disks continue to become less expensive, simply sharing devices to save money is the wrong strategy. What workgroups need is a new approach that provides aids to interpersonal interaction, such as electronic mail, calendars, bulletin boards, software distribution, file and application sharing, and management aids such as backup, fax, and dial-out and dial-in services.

Servers must then be designed for information sharing and traffic and processing needs. Smarter file servers should result in considerably less data traffic as some of the processing is done by the server. According to Sidhu, a simple server receives a request from a user station and then sends a response. An intelligent server works differently. The user "programs" the intelligent server. When an action is required by the server, it can act on the user's behalf to handle the action and/or inform the user about the action and some service or information consequent to the event.

How does this apply to desktop publishing? An example is the personalized newspaper discussed above under "Document Distribution." The user programs the server to recognize specific areas in which he or she is interested, and the server carries out the work. This can be extended from news distribution to the communication of mail, memos, documentation, reports, etc.

Another impact on desktop publishing is that networks should allow easy communication between users with dissimilar machines. As workgroups cooperate on publishing projects, more then one computer system may be used. In this type of environment, communication between the various members of the workgroup must be simple and complete.

Metcalfe, while agreeing with Sidhu on many issues, insisted that networks may never be as simple to use and configure as Sidhu would hope. Users will find that they have to take on

some of the responsibilities of multi-user systems as the power of desktop publishing hardware and software increases.

Future Trends. According to the speakers, we will see hardware improvements in the next year that will make desktop publishing not only more powerful and exciting, but integrated into mainstream computing as well. Faster machines, with 68020 and 80386 microprocessors, will help make this possible. Graphics co-processors from companies such as Texas Instruments and Intel will make systems increasingly powerful. This will greatly benefit desktop publishing.

Steve Jobs stated that WYSIWYG is here to stay and that we will continue to see enhancements to WYSIWYG, such as full page displays. However, full page displays will require the design of new user interfaces. Jobs said that the Macintosh interface, for example, was designed for a smaller screen. With the larger displays, users will find it time-consuming to move the mouse to the top of the screen for menu items.

Some of the future innovations we will see include a move to algorithmic images, which are images defined as programs rather than as bitmaps or compressed bitmaps. Bill Gates believes that PostScript, as it evolves, is certainly powerful enough to do this. Sending bitmaps is too much of a load for most networks to carry; it is better to express them as an algorithmic form that can be five times as compact.

Another trend will be the movement of desktop publishing techniques into conventional publishing such as newspapers and magazines. Even today there are a number of newspapers and magazines printing their camera-ready output on 300 dpi laser printers. When laser printers reach 600 dpi, David Bunnell, publisher of *MacWorld* and *PC WORLD*, said he would seriously consider laser printing for the production of his magazines instead of typesetting.

Kenneth Robinson of Stauffer Communications, a newspaper publishing company, reported that desktop publishing technology will lead to a very distributed method of creating publications. He stated that within ten years 75% of the input to newspapers will come electronically from outside the building. Even now, funeral homes are sending in obituaries by modem.

Desktop publishing is moving upscale to merge with high-end publishing and downscale to merge with word processing. This will lead to a collision when high-powered work- stations reach desktops and desktop computers reach the power of workstations. What will happen when the high-powered, multi-function, multi-user packages meet the single-user packages migrating upward? Some of the speakers believe that downward migration is easier and those desktop publishing programs will prevail.

NEW DESKTOP PUBLISHING PRODUCTS

Ted Hanss

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An exhibition featuring more than 90 companies was held in conjunction with the Desktop Publishing Conference described in the previous article. Over 50 different product announcements were made, ranging from new software to large screen displays for the Macintosh. Some of the more interesting products are described below.

PostScript. Adobe Systems demonstrated the new Atlas board, a PostScript printer controller that greatly increases the speed of the PostScript interpreter. The Atlas board uses a Motorola 68020 microprocessor running at 16.66MHz; the current controller uses a 68000 running at 11.22MHz. While official benchmarks are not available, Adobe estimates that the Atlas board will result in a 200% to 300% improvement over the current controller design. Adobe has also made enhancements to the PostScript code itself that lead to 30-50% faster stroking of lines and 200% faster stroking of characters. (Stroking is the PostScript method of putting images on paper.) The first printer to use the Atlas board will be the Agfa P400PS described below. Adobe also announced a new music font, Sonata, that can be downloaded to PostScript printers.

Macintosh Large Screen Displays. Three new displays for the Macintosh were demonstrated at the conference: the Radius FPD, the Megascreen, and the E-Machines Big Picture. All three screens require dealer installation. Radius demonstrated Full Page Display (FPD), an 8 1/2 by 11-inch screen designed by Burrell Smith and Andy Hertzfeld, who were part of the original Macintosh team at Apple. The 640-by-864 pixel FPD works in concert with the standard Macintosh screen, allowing users to treat the two separate displays as one contiguous screen. The Radius is the only display with this feature. The 15-inch diagonal display allows the use of 16 point menu fonts instead of the standard 12 point, and makes it possible to select zoom boxes for all window-based applications, even applications such as MacWrite that do not use zoom boxes. The Radius list price is $1995.

The Megascreen is a 19-inch diagonal display with a 1024-by-900 pixel resolution, and is more than five times the size of the Macintosh screen. The Megascreen resolution is 72 dots per inch, identical to the Macintosh. The Megascreen includes an NTSC video port that attaches to a video recorder. This makes it possible to create training and demonstration tapes by recording what is shown on the Macintosh screen. The Megascreen list price is $2995. An optional 68881 math co-processor is available for $495.

The E-Machines Big Picture is a 17-inch diagonal display with a 1024-by-808 pixel resolution. The Big Picture requires an update to system folders that allows applications to recognize the larger display area. The Big Picture is available for $1995.

MS-DOS Page Composition Software. Harvard Professional Publisher was introduced by Software Publishing Corporation. The program is a modification of Bestinfo's Superpage program that provides a new user interface. Features of the program include automatic hyphenation and justification; automatic adjustment of spacing between characters (kernel and tracking); vertical justification and column balancing; and support for all PostScript fonts and Hewlett-Packard soft fonts. Page design features include style sheets; an unlimited number of pages per document; multiple columns on a page; automatic page numbering; interactive on-screen editing; and either interactive or batch formatting. The program runs on IBM PC-compatibles with a hard disk and either a Hercules Graphics Adapter or an IBM Enhanced Graphics Adapter (EGA). The $695 program is scheduled to be shipped in November.

A new PC version of Aldus PageMaker will be released by the end of this year. Running under Microsoft Windows, PC PageMaker will include all the features of the Macintosh version and more than 20 new features, including automatic dictionary-based hyphenation and justification; improved control over typographic quality; and support for documents up to 128 pages long and 17 by 22 inches in size. PC PageMaker will accept pre-formatted text files from Microsoft Word, WordPerfect, Multimate, WordStar 3.3, Xywrite III, and Microsoft Windows Write. It will also accept importation of graphics from several "paint" programs. The recommended configuration for PC PageMaker is an IBM PC/AT-compatible, a hard disk, an IBM EGA or a Hercules Graphics Adapter, and a mouse. PC PageMaker will be available for $695.

Xerox announced that it will market Ventura Publisher, a composition package designed for use with large documents. Ventura Publisher runs under the Gem operating environment and accepts input from a number of word processing and graphics packages. Other features include the use of style sheets to control design, and automatic generation of table of contents and indices. Ventura Publisher runs on IBM PC-compatibles with hard disks and graphic displays. The program supports several laser printers, including the Apple LaserWriter and the Xerox 4045. The $895 program will begin shipping in November.

Macintosh Page Composition Software. Aldus demonstrated Macintosh PageMaker Version 2.0, which will be available in January. New features of the program include powerful hyphenation and kerning; better word, letter, and paragraph spacing controls; support for strikethrough characters, small caps, and all caps; typographic fixed spaces (em and en spaces); files of up to 128 pages; interactive facing pages; print spooling to laser printers; and better Imagewriter support. PageMaker Version 2.0 will be available for under $500 or as a $75 upgrade to registered users.

Ready, Set, Go 3 was introduced at the show and includes a number of new functions. The program features an unlimited number of document pages; interactive text editing with a built-in word processor; importation of formatted MacWrite and Word documents; hyphenation and kerning; and a 60,000-word spelling checker. The program lists for $295 and will start shipping in November. Ready, Set, Go 3 will be available as a $60 upgrade to registered users.

Ragtime is one of the first integrated page composition packages available for the Macintosh. Ragtime features four main functions: page layout, word processing, a spreadsheet, and a forms generator. In addition, pictures, graphics, and drawings can be easily inserted directly into any Ragtime document. Ragtime can handle documents up to 250 pages long. All operations are fully WYSIWYG and the entire document is quickly updated upon any insertion or deletion. Ragtime is available for $395.

Graphics arts firm Letraset purchased Boston Software Publishers, and will release a new version of MacPublisher in November under the name Letrapage. New features include the ability to compose 1000-page documents; a new toolbox; automatic hyphenation; manual and automatic kerning; automatic creation of table of contents; and the ability to delete files from within the application to make room on the disk. It will be possible to output documents to disk in MacDraw and MacPaint format so the file can be viewed by someone without the Letrapage program. The program costs $195.

Laser Printers. The Laser Connection, a subsidiary of QMS, introduced PS Jet, a complete PostScript upgrade kit for laser printers such as the Hewlett-Packard LaserJet, LaserJet Plus, and the QMS LaserPrinter. The 15-minute user-installed upgrade results in a 100% LaserWriter-compatible printer. The PS Jet includes RS232C, RS422, and AppleTalk ports; two megabytes of memory; and four resident font families (Times, Helvetica, Courier, and Symbol). The PS Jet retail price is $2995.

Agfa-Gevaert demonstrated the P400PS printer, a 400 dots per inch (dpi) PostScript printer using LED array electrophotographic marking technology. The P400PS is the first printer equipped with the Adobe Atlas controller and is capable of up to 18 original pages per minute. The printer has a 20 megabyte hard disk for storing fonts; RS232C, RS422, Centronics parallel, and AppleTalk ports; 2000 and 200 page input trays; a 500 page output tray; a one megabyte font cache; and two two-megabyte frame buffers (while one page is being printed from one frame buffer, the next page is prepared in the other frame buffer). The P400PS is rated for 100,000 sheets per month and will begin shipping in February. It will sell for $28,000.

CHANGES TO LOCALNET CALL NUMBERS AT CSO SITES

Stan Kerr

In October, a change was made to LocalNet access at CSO terminal sites. CSO sites Commerce West, Electrical Engineering, CRH Snack Bar, Mechanical Engineering, Psychology and Social Science were placed on a different University broadband channel for LocalNet access. This resulted in a change to the LocalNet CALL addresses for CSO machines when called from these sites. The new CALL numbers to be used at these sites are:

Cyber 175 (NOSA)	CALL 1650
IBM VMD (line mode)	CALL 4000
IBM VMD (7171)	CALL 4400
IBM VME (7171)	CALL 4600

The change was made for two reasons:

1. Broadband channels were handling more traffic than was reasonable for them, resulting in more frequent failures.
2. Putting CSO sites on a separate channel allows CSO to give more equitable treatment to those who have paid for LocalNet access to our systems; they are no longer competing with users at the remote sites for machine access.

LOSING IT!

Beth Engelbrecht-Wiggans

It's half-past Midnight. You have just added the last three lines to your research data. You issue the FILE command and hit the enter key. Nothing happens. You wait...two minutes...three minutes, you call the computing center and get a busy signal. The pit of your stomach feels like it's harboring a lump of ice because you know the system has just gone "down," and you're afraid it took all your data with it.

Don't panic! Probably the worst thing that has happened is that you've lost what you entered during the current XEDIT session, and if you used SET AUTOSAVE, maybe nothing. This article is to help you recover your data, if not your cool.

In the situation just described, the thing to do is wait for the system to come back and then look at your filelist and see what files are on your disk. There are several possibilities. If the file you were working on existed before the XEDIT session you were in, it is likely that it will be on your disk. It may be the "old" version before your most recent changes, but that is better than nothing. If you are unusually lucky, the FILE command may have completed and "everything" will be there. In some cases the original file may be completely gone. (Remember, don't panic!) In that case there will be a file called XEDIT CMSUT1. That file will be your "lost" file and you just need to rename it.

XEDIT uses a procedure that reduces the possibility of losing a file due to a system crash when it is saving or filing. First, the new version of the file is written onto your disk under the name XEDIT CMSUT1. After that file is written, the old copy of your file is erased and the new version renamed to the original name. This way there is **always** at least one copy of the file on disk. The only time this doesn't help is if you are working on a completely new file.

If you are in the process of creating a new file by typing in data and the system goes down, it is entirely possible to lose everything you've done. In order to prevent this, you can issue a SAVE command periodically during the XEDIT session and the file will be written on your disk. SET AUTOSAVE is a command that you can use to tell XEDIT to automatically SAVE your file after a specified number of changes. These two commands can help prevent loss of data and sanity. To learn more about these commands, simply issue the HELP command during an XEDIT session.

You say that's fine, but what about the file you just erased last week and now find that you need desperately? Well, all is not lost there either. If the file had been around for at least one night, the Computing Services Office (CSO) will have made a backup copy on a computer tape using VMBACKUP, a software package from VM Software, Inc. No, we haven't been looking at your files, but we have been making backups. Each user on CMS has a piece of a disk pack assigned to his or her userid. CSO makes a copy of each disk pack, with hundreds of users on each pack, every Monday morning. Then every other morning, a backup is made of disk files that have been modified since the previous Monday's dump. The incremental tapes are recycled every week, and the full Monday dump tapes are recycled every month. Also, the tapes from the first Monday of each month are recycled every four months. So, suppose today is December 3, 1986. The following is a list of the dump tapes:

List of Dump Tapes as of December 3, 1986

date dumped	description	date recycled
Dec 3	Wednesday incremental dump	Dec 10
Dec 2	Tuesday incremental dump	Dec 9
Dec 1	First Monday dump of all disk files	April 6
Nov 30	Sunday incremental dump	Dec 7
Nov 29	Saturday incremental dump	Dec 6
Nov 28	Friday incremental dump	Dec 5
Nov 27	Thursday incremental dump	Dec 4
Nov 24	Fourth Monday dump of all disk files	Dec 22
Nov 17	Third Monday dump of all disk files	Dec 15
Nov 10	Second Monday dump of all disk files	Dec 8
Nov 3	First Monday of month dump tape	March 2
Oct 6	First Monday of month dump tape	Feb 2
Sept 29	Fifth Monday dump of all disk files	Dec 29
Sept 1	First Monday of month dump tape	Jan 5

With these backups it is possible to restore files that were inadvertently erased or lost due to some computer catastrophe. Any CSO consultant can restore a file for you. In most cases the turnaround time for a restore job is less than an hour, but some tapes are stored in another building, so the restores may take a day. Obviously, the file must have been on your disk at the time the backup was made and it will be restored in the condition it was in at that time. For example, if you created a file December 3 and deleted it on December 4 (note that this file did not exist on Monday, December 1), it would be available on a backup tape until December 9 from the tape that was written late evening/early morning December 3. If CSO changes the backup schedule, we will publish the new schedule in *Off-Line*.

Having space problems? Then you should consider doing your own backups. There are three types of additional storage that you can ask for, two of which are discussed in other articles in this issue of *Off-Line*. For very short term storage you can use FSF (File Storage Facility),

which allows you to "rent" a disk for up to two days (48 hours). For medium time span storage (not more than a year) you can use VMARCHIVE. Please see the following articles for more information on these two new offerings. Last, but not least, you can write your own backup tape. For help on tapes, come see the Systems Consultants at 1208 W. Springfield.

FILE STORAGE FACILITY (FSF) FOR THE IBM/CMS VMD SYSTEM

Scott LeBaron

You're working on a large project using a program that creates many temporary data files. Unable to keep all this data on your own disk, you enter the TD command to obtain temporary disk space for these files to reside on. You then begin running your program. The program runs fine for an hour and is nearing its end, when you suddenly hear a beep and the VM logo appears on your screen. What has happened? Well, occasionally the system does go down unexpectedly, logging you off, and releasing your temp disk which contained all the data created by your program. When this happens it's time to start over...

Sound familiar? How about those times when you really need some temp space, so you issue the TD command, only to receive in return a message stating "SPACE NOT AVAILABLE."

There is definitely a need for a more stable form of temporary storage — disk space that is available when you need it and that can retain data even after you log off or the system crashes.

Now there is a remedy for these situations. IBM's File Storage Facility (FSF) is a package that can handle these demands. You can now "rent" a disk for a specified time period. We call this rented disk an "R-disk."

In contrast to a T-disk, whose lifespan is the duration of your logon session, a disk obtained from FSF is yours to use for an amount of time determined by you, up to two days (48 hours), regardless of how many times you've logged on and off, and no matter how much trouble the system is having. In addition, you can optionally specify one other user who can access this "rented" disk for the duration of the rental period.

FSF SUBCOMMANDS

There are four subcommands FSF can process: BORROW, USE, QUERY, and RETURN. These subcommands are summarized below:

BORROW	Specifies that you want to rent a disk. You specify a name for the disk, and optionally a size in kilobytes (Kb), a rental period (in hours), and a co-owner. Once this subcommand is issued and a disk obtained, the BORROW subcommand is not used again for that particular disk.
USE	Accesses the disk you have rented. If you've logged off since you borrowed the disk, the USE subcommand re-accesses the disk for you at a virtual address and a filemode. Any files that were on the disk when you logged off are still there. You can specify either READ/WRITE or READ/ONLY.
QUERY	Displays information about your rented disk. Name of disk, size, when it should be returned and the co-owner, if any, will be given.
RETURN	Returns the disk to FSF before the specified time limit is up.

FSF DEFAULTS

FSF assumes defaults if it is not given parameters by the user. For a BORROW subcommand, the time defaults to 48 hours (2 days), size to 1000 Kb (5 cylinders of 3380 disk with a 4 Kb-blocksize), and no co-owner. A name for the disk MUST be given directly by the user. (Also see LOCAL LIMITS below).

For USE, the name must again be given directly, but the virtual address and filemode will default to the first available address (starting at 120) and mode letter, respectively. Access will default to READ/WRITE.

FORMAT

To access FSF (File Storage Facility), you must first enter

```
LINKTO FSF
```

All subcommands should be preceded by **FSF**. The subcommands and their parameters can be entered in two different ways. They can be placed on the command line:

```
FSF BORROW TESTDISK 1000 (TIME 4 WITH id2
```

Or they can be entered in a prompting mode if you issue the command **FSF RDIsk**. FSF will then prompt you to enter values for the subcommand and its parameters.

Entering FSF alone on the command line will display a brief summary of the subcommands. If you want details on the parameters for these subcommands, enter **FSF RDIsk ?**.

ACCOUNTING

Users will be charged for their rented disk according to two factors: the size of the disk rented and the amount of time the disk was rented. This time is not necessarily the same as the original time stated on the BORROW subcommand since you can use the RETURN subcommand to give up the disk anytime you are completely finished using it. At the point the disk is returned, either by you or by FSF at its expiration point, your account will be charged using the actual length of time you rented the disk.

A NOTE ON THE RETURN SUBCOMMAND

When you issue the RETURN subcommand, you are indicating that you have finished using that rented disk. FSF marks it as available for anyone's use and THE DATA ON IT IS ERASED. Make sure you are completely finished with a rented disk before you RETURN it.

Also, before you can RETURN a disk, you must not be attached to it (through the USE subcommand). RELEASE and DETACH the disk before attempting to RETURN it, using the appropriate CP command. (For example, if you USE a disk and it is on your E disk, you can issue REL E (DET to detach the disk, and then RETURN it if you are done with it.

LOCAL LIMITS

The following limits apply:

- The maximum time you can rent a disk for is 48 hours (two days).

- Only one disk can be rented to a user at one time.
- Only one co-owner can be specified for a rented disk.

FSF uses IUCV for communication purposes. When the system is busy, FSF may take some time in answering your request. It has a built-in feature which will halt the command if it senses it is hung and will issue you a message stating IUCV did not respond if it can not execute the command within a set amount of time. If this happens, your last command was NOT executed and you should issue it again.

AT the present time, FSF has 1-, 5-, and 10-cylinders of 3380 disks to rent. These are formatted with a 4 Kb- blocksize, which means there are 600Kb per cylinder. FSF will allocate the smallest disk it can to you, while fulfilling your requirements for space. Hence, if you request 700 Kb of space, the smallest disk FSF can give you and still fulfill your request is a 5-cylinder disk with 3000 Kb.

Please direct any questions or comments to Scott LeBaron, 197 DCL, 244-3215, or send a message via SCOTT@UIUCVMD. I am in 197 DCL.

SUMMARY OF FSF SUBCOMMANDS

The formats of the FSF subcommands are:

```
FSF  BORrow  name kb (WITh x TIMe x
FSF  USE     name vaddr fm (ACCess x
FSF  RETurn  name
FSF  Query   name
```

where

name	is the name you assign(ed) to the borrowed minidisk.
kb	is the size of the space you request, in KILOBYTES. The default is 1000.
vaddr	is the virtual address used for the minidisk. The default is the first free address starting at 120.
fm	is the CMS filemode for the disk. The default is first free mode available.

and the keyword parameters are:

TIMe x	number of hours you wish to borrow the disk. Maximum amount of time allowed is 48 hours or two days. (DEFAULT IS 48).
WITh x	to identify a "co-owner" of an R-disk. The default is no co-owner. NOTE: If you use the R-disk from VMBATCH, **VMBATCHx** must be given as co-owner (where **x** is a letter of your choice).
ACCess x	specify READ or WRITE, depending on how you wish to use the disk. WRITE is the default.

NOTE: The FSF command is an EXEC, so if it is invoked within a CMS EXEC or an EXEC2 EXEC, the word EXEC must precede the command, e.g., EXEC FSF BORROW X.

CONSERVING YOUR MINIDISK SPACE USING VMARCHIVE ON IBM/CMS

Greg Kesner

The VMARCHIVE software product on our VMD computer enables you to move some of your CMS files off of your 191 minidisk into a system storage area. This software system operates under the CMS userid VMARCH and enables you to keep accessible the files you less frequently use while also freeing your minidisk storage space for other files. You may find this especially helpful if you have a small 191 minidisk.

To use VMARCHIVE, you must first link to it using the command:

```
LINKTO VMARCH
```

and then issue VMARCHIVE instructions via the VMARCH command. The VMARCH command enables you to archive files from any minidisk to which you have read/write access. You may also use the command to display the files you have already archived and to recall any of those files to your virtual reader or your minidisk.

For the present, we have implemented locally only the STAGE form of VMARCHIVE storage. In this case, when you archive one or more files, the files are stored in an on-line STAGE storage area. Each day after midnight, the files archived over the last 24 hours are copied to magnetic tapes in the archive tape pool. At this point, the files reside both in the on-line STAGE storage and in the archive tape pool. You then receive a file in your virtual reader from the userid VMARCH containing a list of the files copied to tape belonging to you. At this point, you may use the CMS ERASE command to remove the files from your minidisk to free space for other work. Whenever you need a file you have archived, you use the RECALL instruction on the VMARCH command to recall the file to either your virtual reader or minidisk. You need not be concerned with where you archived files are stored as this is managed by the VMARCHIVE system. We will regularly remove files from the on-line storage area when the on-line storage becomes filled. Please note though that the files will still be available for recall from the archive tape storage until their expiration date is reached.

The general policy for retention of files stored in the VMARCHIVE system is 366 days from the date of archive. At the time when the file is archived, an expiration date for the file is set based on the retention period. You may change this date at any time prior to the expiration date using the VMARCH CHANGE command with the EXPDT parameter. However, the latest expiration date you may set is no more than 366 days from the current date. This means a file is retained either in the on-line STAGE area or in the archive tape pool for one year from the date you archived or recalled the file, or the last date you issued a VMARCH CHANGE command for the expiration date of the file. Each time you issue a VMARCH RECALL command for a file, the expiration date of the file is updated to be 366 days from the current date. Files remain in the on-line STAGE area according to three criteria: the amount of on-line STAGE space available, the size of the file, and the file expiration date. When the on-line STAGE becomes full, the largest and oldest files will be removed from the on-line space. However, they will still remain in the archive tape pool for a year from the date of last access and may be recalled in the same manner as files from on-line STAGE. The major advantage of files remaining in on-line STAGE is a faster response time for recalls since no operator intervention is required to mount an archive tape.

Important Note: The on-line STAGE file storage is limited in size and used by many computer users. You are urged to assist in the management of the file space by using the VMARCH PURGE instruction to purge files you no longer need to have in archive storage. Also note

that a policy has been established limiting the number of copies of a specific file in the VMARCHIVE system to one.

HOW TO ACCESS VMARCHIVE AND OBTAIN DOCUMENTATION

To access the VMARCHIVE software, use the CMS command:

LINKTO VMARCH

Onced linked to VMARCHIVE, you may issue instructions to archive, recall, or query VMARCH about your archived files via the VMARCH command. You may view on-line help about VMARCH instructions by issuing the CMS command:

HELP VMARCH MENU

You may also use the CSO WRITEUP command to obtain hard-copy listings for these help files. (Enter the CMS command: HELP CSO WRITEUP, for more details.)

A user's guide is also available in the CMS file: VMAUSER LISTING which is located on the VMARCH minidisk linked when you issue the **LINKTO VMARCH** command. To print this file on the IBM 3800 printer, use the command:

NPRINT VMAUSER LISTING * (DEST 3800 EJ CC BIN xx PDEF LR66 CHARS GT15

where **xx** is the two-digit bin number where you wish the output stored in room 14 Digital Computer Lab (DCL).

Please note that *VMARCHIVE User's Guide* contains complete information on the VMARCHIVE system and serves both as a guide to features and a VMARCH subcommand reference. When referring to it, remember that only the STAGE form of archive storage is implemented locally. The on-line help files provide concise explanations of the instructions (subcommands) you may use with the VMARCH command.

USING VMARCHIVE SUBCOMMANDS

The VMARCH command is used to submit instructions to the VMARCHIVE system. These instructions are termed "subcommands." Several useful VMARCH subcommands will be discussed here. The entire set of subcommands are documented in the VMARCH help files and the *VMARCHIVE User's Guide.* The ARCHIVE and QUERY subcommands may be used in what is termed either a line mode or a full-screen mode which closely resembles the RDRLIST or FILELIST CMS environments. From within the full-screen listing created by the QUERY subcommand with the MENU option, you may enter the RECALL, CHANGE, PURGE, or CANCEL subcommands to recall a file to your reader, change a file expiration date, purge a file from archive storage after it has "aged" 24 hours in STAGE storage, or cancel the archiving of a file if the request is less than 24 hours old.

USING THE ARCHIVE SUBCOMMAND TO ARCHIVE YOUR FILES

You may archive to STAGE storage any files that are less than 10 megabytes in size and that are located on any disk to which you have READ/WRITE access. Typically, you will be archiving files from your 191 A disk or perhaps a temporary minidisk which you created via the CSO TD (temporary disk) command or a disk you have rented from the CMS FSF system (File Storage Facility; see an accompanying article in this issue for more details). Since the temporary disk will "vanish" when you log off CMS and the rental minidisk is available for only two days, you may find VMARCHIVE very helpful in managing the files you are using that are too large for your 191 disk. For the purpose of examples in the following subcommand

descriptions, let's assume we have issued a TD command and that the temporary disk is at virtual address 120 and mode B. Also, in the discussion **fn** refers to the filename of a CMS file, **ft** refers to its filetype, and **fm** refers to its filemode. Let's also assume our CMS userid is MOZART.

To archive a single file from your 191 A minidisk, issue the command:

VMARCH ARCHIVE fn ft

Example: VMARCH ARCHIVE CENSUS DATA1

archives the file CENSUS DATA1 from the 191 disk. Notice that a filemode is not specified and therefore defaults to A.

To archive a single file from your temporary 120 B minidisk, issue the command:

VMARCH ARCHIVE fn ft fm

Example: VMARCH ARCHIVE CENSUS DATA1 B

archives the file CENSUS DATA1 from the temporary disk at mode B. The file is associated with virtual address 120 for future file recalls or queries (the implications of this will be explained with the RECALL and QUERY subcommands).

To archive multiple files, you could issue individual ARCHIVE subcommands for each file, or you may use an asterisk as a pattern matching character in the filename or filetype to specify a group of files with similar filenames or filetypes. For example, if you have multiple SAS data sets all having the filetype SASDS1, you could use an asterisk for the filename.

Example: VMARCH ARCHIVE * SASDS1

archives all files on the 191 A disk with a filetype of SASDS1.

An easier way to archive multiple files from a particular minidisk is by using the MENU option to have VMARCHIVE display a full-screen listing of the files specified by the **fn**, **ft**, and **fm** fields of the ARCHIVE subcommand. The pattern-matching for the fileids specified by these fields is like that of the CMS FILELIST command. If none are specified, VMARCHIVE will construct a list of all files on your 191 minidisk.

Example: VMARCH ARCHIVE (MENU

displays a full-screen list of all files on the 191 disk. (See Figure 1 for an example.)

Within the full-screen listing, you may enter subcommands next to the file identifiers on the far left of the screen. By entering the subcommand ARCHIVE (which can be abbreviated to **ar**) next to one or more file identifiers and then pressing the ENTER-key, an ARCHIVE subcommand is executed for each file. In Figure 1, the THESIS2 SCRIPT and THESIS3 SCRIPT files will be archived once PF10 is pressed (notice the legend at the bottom of the full-screen listing which indicates PF-key definitions). When you are finished archiving files, press PF3 or enter the QUIT command on the command line at the bottom of the screen.

```
28MAR86 Release 4.0        V M A R C H I V E    (c) 1986, VM Software, Inc.

                  CMS Files Available For Archival For: MOZART
Cmd   Filename Filetype Fm Format Lrecl  Records  Blocks   Date     Time

      ALL      NOTEBOOK A0 V         74      220      10  9/26/85 16:36:07
      PT1      EXEC     A1 V         60       15       1  9/24/85 12:31:12
      THESIS1  SCRIPT   A1 V         68      156       3  9/17/85 17:23:09
ar    THESIS2  SCRIPT   A1 V         76      800      35  9/17/85 17:23:09
ar    THESIS3  SCRIPT   A1 V         76      801      35  9/17/85 17:23:09
      PROFILE  EXEC     A0 F         80       18       2  7/06/86 14:19:11
      PROFILE  XEDIT    A1 V         70      123       3  7/19/86 17:11:45


1= Help       2= Refresh   3= Quit     4= Stype     5= Sdate    6= Sname
7= Backward   8= Forward   9= Ssize   10= Archive  11= Xedit   12= Cursor

====>
```

Figure 1. Archiving Multiple Files from a Full-Screen Listing

Remember that archived files remain in on-line STAGE until storage is full and some files must be removed to free space. All files are copied to the archive tape pool storage within 24 hours. If you wish to remove a file from the VMARCHIVE system before it has been copied to the archive tape pool, you must use the VMARCH CANCEL subcommand. If the file has "aged" 24 hours and has been copied to the archive tape pool, you must use the VMARCH PURGE subcommand to remove the file. See the *VMARCHIVE User's Guide* or the CMS VMARCH help files for further details on using CANCEL versus PURGE.

USING THE QUERY SUBCOMMAND FOR ARCHIVED FILE INFORMATION

The VMARCH QUERY FILES subcommand displays information about the files you have archived. By default, it lists information about files archived from your 191 A minidisk. The **FOR *** option lists all the files you have archived from all minidisks. This is certainly the easiest form of the subcommand to get the most extensive information, though sometimes the list may be quite long. The **MENU** option instructs VMARCHIVE to prepare a full-screen listing of the files, which is similar in format and functionality to the CMS FILELIST command.

Example: VMARCH QUERY FILES (MENU FOR *

lists on the screen all files archived from all minidisks.

```
28MAR86 Release 4.0        V M A R C H I V E    (c) 1986, VM Software, Inc.

                    CMS Files Previously Archived For: MOZART
 Cmd   Filename Filetype Cuu   Date    Time  Refnm   Recs  Expdt    Status

       REG1     SASDS1   120 06/20/86  9:15    50    147 06/23/87 OFF STG
       REG1     SAS      120 06/23/86 12:15    56    147 06/23/87 OFF STG
       REG1     LISTING  120 06/23/86 12:32    57   3789 06/23/87 OFF STG
       REG1     SASLOG   120 06/23/86 12:32    58    177 06/23/87 OFF STG
       THESIS2  SCRIPT   191 04/18/86 11:11    10    801 06/10/87 OFF STG
       THESIS3  SCRIPT   191 04/06/86 21:03    11    800 06/10/87 OFF STG
       COMM     SCRIPT   191 09/10/86 13:20    37    105 09/11/87 OFF STG
       GETFS    EXEC     191 08/15/84 12:31    40     17 09/01/87 OFF STG
       MSG      PROB     191 09/26/86 15:12    43     15 09/01/87 STG


 1= Help       2= Refresh   3= Quit      4= Stype     5= Sdate    6= Sname
 7= Backward   8= Forward   9= Q F /n   10= Recall   11= Sexpdt  12= Cursor

 ====>
```

Figure 2. Full-Screen Listing of Archived Files from 191 & 120 Disks (Disk 120 was a temp-disk)

USING THE RECALL SUBCOMMAND TO RESTORE FILES FROM ARCHIVE STORAGE

From the QUERY FILES full-screen listing, you may enter one or more subcommands (**recall** may be abbreviated to **rec**) next to file identifiers to request that files be recalled from archive storage and placed in your virtual reader for you to restore to your minidisk using the CMS RECEIVE command. For each file to be recalled, enter the RECALL subcommand next to the file identifier (on left of screen) and then press the ENTER-key. Recall requests will be submitted for those files and they will be placed in your virtual reader. In Figure 3, the files REG1 SASDS1 and COMM SCRIPT will be recalled from archive storage and placed in the virtual reader of userid MOZART.

```
28MAR86 Release 4.0        V M A R C H I V E    (c) 1986, VM Software, Inc.

                    CMS Files Previously Archived For: MOZART
 Cmd   Filename Filetype Cuu   Date    Time  Refnm   Recs  Expdt    Status

 rec   REG1     SASDS1   120 06/20/86  9:15    50    147 06/23/87 OFF STG
       REG1     SAS      120 06/23/86 12:15    56    147 06/23/87 OFF STG
       REG1     LISTING  120 06/23/86 12:32    57   3789 06/23/87 OFF STG
       REG1     SASLOG   120 06/23/86 12:32    58    177 06/23/87 OFF STG
       THESIS2  SCRIPT   191 04/18/86 11:11    10    801 06/10/87 OFF STG
       THESIS3  SCRIPT   191 04/06/86 21:03    11    800 06/10/87 OFF STG
 rec   COMM     SCRIPT   191 09/10/86 13:20    37    105 09/11/87 OFF STG
       GETFS    EXEC     191 08/15/84 12:31    40     17 09/01/87 OFF STG
       MSG      PROB     191 09/26/86 15:12    43     15 09/01/87 STG


 1= Help       2= Refresh   3= Quit      4= Stype     5= Sdate    6= Sname
 7= Backward   8= Forward   9= Q F /n   10= Recall   11= Sexpdt  12= Cursor

 ====>
```

Figure 3. Recalling Files from Archive Storage

USING THE PURGE SUBCOMMAND TO PURGE FILES FROM ARCHIVE STORAGE

At times you will no longer need to keep a file in VMARCHIVE storage. If a file has been in on-line STAGE storage for more than 24 hours (and has therefore been copied to the STAGE tape pool), it may be purged from archive storage using the VMARCH PURGE subcommand (abbreviated PUR). Notice in Figure 4 how such a file has a status of OFF STG. You enter the PURGE subcommand in the same manner as the RECALL subcommand from the QUERY FILES subcommand full-screen listing. If the file has a status of STG, the PURGE subcommand will not remove the file. Instead, you must use the CANCEL subcommand (abbreviated CAN) to remove the file. In Figure 4, the file GETFS EXEC will be purged from the archive storage area. The CANCEL subcommand is used to remove the file MSG PROB.

```
28MAR86 Release 4.0        V M A R C H I V E    (c) 1986, VM Software, Inc.

                    CMS Files Previously Archived For: MOZART
Cmd   Filename Filetype Cuu   Date    Time  Refnm   Recs  Expdt    Status

      REG1     SASDS1   120 06/20/86  9:15    50    147 06/23/87 OFF STG
      REG1     SAS      120 06/23/86 12:15    56    147 06/23/87 OFF STG
      REG1     LISTING  120 06/23/86 12:32    57   3789 06/23/87 OFF STG
      REG1     SASLOG   120 06/23/86 12:32    58    177 06/23/87 OFF STG
      THESIS2  SCRIPT   191 04/18/86 11:11    10    801 06/10/87 OFF STG
      THESIS3  SCRIPT   191 04/06/86 21:03    11    800 06/10/87 OFF STG
      COMM     SCRIPT   191 09/10/86 13:20    37    105 09/11/87 OFF STG
pur   GETFS    EXEC     191 08/15/84 12:31    40     17 09/01/87 OFF STG
can   MSG      PROB     191 09/26/86 15:12    43     15 09/01/87 STG

1= Help       2= Refresh   3= Quit      4= Stype     5= Sdate    6= Sname
7= Backward   8= Forward   9= Q F /n   10= Recall   11= Sexpdt  12= Cursor

====>
```

Figure 4. Purging a File from Archive Storage

SUMMARY

This introduction to VMARCHIVE has covered some of the basic uses of the file archival system. Other features are described in the *VMARCHIVE User's Guide.* One of the most common applications of VMARCHIVE will be with the use of temp-disks to either archive files from your temp-disk prior to logging off, or to recall files from VMARCHIVE storage to a temp-disk during a new CMS session to continue your work.

Another CMS utility, FSF (File Storage Facility) allows you to "rent" a minidisk for a period of two days or less. VMARCHIVE in conjunction with FSF provide you with significant resources to accomplish you work in CMS.

GRG OPTIMIZATION PACKAGE ON VMD

Stan Kerr

The GRG nonlinear programming package (which we have on the Cyber 175) has been installed on the VMD system. The version installed on VMD is a double precision version,

which should provide accuracy comparable to what is achieved by the Cyber's single precision version. It is accessed by the command

LINKTO GRG

There is a CSO help file on GRG, which can be viewed by entering

HELP CSO GRG

The GRG disk contains a manual, which you can print after entering the LINKTO GRG command, by entering

NPRINT GRG MANUAL * (CC EJ DEST xxx

where xxx is some CSO print site. The IBM 3800 printer at DCL is an excellent means of getting a good copy of the manual; to print it on the 3800, we recommend the following:

NPRINT GRG MANUAL * (CC EJ DEST 3800 PDEF LR66 FONT GT12

MP MULTIPLE-PRECISION PACKAGE INSTALLED ON VMD

Stan Kerr

The MP multiple-precision package has been installed on the VMD system. (We also have MP on the Cyber 175.) MP allows you to construct and manipulate floating point numbers of arbitrary precision. The multiple-precision numbers are set up in Fortran integer arrays, and calls to MP routines are used to perform arithmetic operations on the numbers. MP has an extensive library of transcendental function routines for multiple-precision numbers, and routines for converting character strings and ordinary floating point numbers into multiple-precision numbers.

MP is accessed on VMD by the command

LINKTO MP

Following this, you can compile and run a Fortran program which calls the MP routines.

There is a CSO help file on MP, which can be viewed by entering

HELP CSO MP

The MP disk contains a manual for MP. After the command LINKTO MP is issued, this manual can be printed by entering:

NPRINT MP MANUAL * (CC EJ DEST xxx

where xxx is some CSO print site. The IBM 3800 printer is an excellent means of printing a good copy of the manual; we recommend printing the manual as follows:

NPRINT MP MANUAL * (CC EJ DEST 3800 PDEF LR66 FONT GT12

MINOS VERSION 5 INSTALLED ON VMD

Stan Kerr

Version 5 of the MINOS nonlinear programming package has been installed on the VMD system and can be accessed by the command

LINKTO MINOS (F

This version will become the default version of MINOS at the end of the Fall semester. At that time, the command LINKTO MINOS (PAST will be necessary to access Version 4. Version 4 will be retained for a few months beyond that.

There is a CSO help file which briefly describes both the current version (4) and the new version; it can be viewed by entering

HELP CSO MINOS

Presently we have no other on-line documentation for MINOS. A copy of the version 5 manual is available for viewing at the CSO Systems Consulting Office at 1208 W. Springfield, Urbana.

Version 5 of MINOS has one important new feature not offered by version 4, namely that it can now be requested to compute numerical partial derivatives for the nonlinear part of the objective function and the nonlinear parts of the constraints. Users of version 4 are required to provide Fortran code of their own to evaluate these partial derivatives.

USING MPROBIT AND MLOGIT PROCEDURES WITH SAS

Vicky Dingler

CSO has recently obtained two SAS procedures written by Salford Systems that perform statistical analyses on categorical data. The MPROBIT and MLOGIT procedures can be called from within SAS by using familiar SAS procedure statements. The following information is reprinted from the MPROBIT and MLOGIT documentation.

MPROBIT is a binary probit procedure for the maximum likelihood estimation of models with binary dependent variables. The procedure produces parameter estimates, variance-covariance matrices, log likelihood values, predicted z-scores and inverse Mills' ratios.

MLOGIT is a multinomial logit procedure for the estimation of regression models with qualitative (categorical) dependent variables by the method of maximum likelihood. Both conditional and polytomous models can be estimated. The procedure computes parameter estimates, variance-covariance matrices, log likelihood values and the derivatives of the predicted probabilities with respect to the independent variables.

Documentation is available at no charge at the CSO Statistical Consulting Office at 85 Commerce West. The office hours are 9-1 Monday and Wednesday, 9-5 Tuesday and Thursday, and 9-11:45, 1:15-5 on Friday. The telephone number is 333-2170. If there are any questions, please refer them to the consultants in the Statistical Consulting Office.

SPSS RELEASE 9 AVAILABLE ON THE CYBER

Joan Mills

About a year ago, CSO decided to skip installing SPSS Release 9 on the Cyber 175 in favor of installing SPSSX. SPSSX proved to be incompatible with the NOS 1 operating system on the Cyber 175, so SPSSX was installed on the Cyber 174 which was running NOS 2 at the time. When the Cyber 174 was taken out of service, renewed effort was generated to make SPSSX compatible with NOS 1 on the Cyber 175 (NOSA). After making further inquiries, it was decided that this still was not feasible. Therefore, to provide our Cyber SPSS users with the most up-to-date product that we can, we have installed the long neglected SPSS Release 9.

SPSS Release 9 on the Cyber is accessed by entering

GRAB,SPSS/F.

The basic call sequence for the product is the same as for SPSS Release 8.3 on the Cyber, namely:

SPSS,I=prog,D=data,L=outfile,NR

where **prog, data** and **outfile** are files of SPSS program statements, user data (if separate) and program output, respectively.

Enhancements made in SPSS Release 9 include the addition of BOX-JENKINS and NEW REGRESSION procedures, new facilities in CANCORR, MULT RESPONSE, ONEWAY and MANOVA, and faster algorithms in BREAKDOWN, CROSSTABS and ONEWAY. The *SPSS Update 7-9 Manual* provides the necessary documentation for these additions and changes. In addition, a document called *SPSS-6000 Version 8.3 to 9.0 Changes* is available at the CSO South Statistical Consulting Office, 85 Commerce West.

One of the problems prompting the skipping of Release 9 in favor of SPSSX was the presence of new "bugs" in familiar procedures in Release 9. For this reason, we may keep Release 9 as a "future" product for an extended period of time, depending on our experience with it. This will encourage the users who do not need the new procedures and enhancements of Release 9 to continue to use the "tried and true" Release 8.3. Errors known to have existed at the time we received the product are as follows:

- BOX-JENKINS — This procedure produces a mode error when more than approximately 400 cases are run.
- T-TEST — When the PAIRS= construct is used to specify multiple variable pairs, only the first pair is processed. This bug sneaked through from Version 8.3.
- Transformations — The exponential of negatives is incorrectly created as a domain error.
- RELIABILITY — When invoked with options 11 and 14, the resulting ANOVA table shows "bogus" F-ratios and significance probabilities. In addition, the means written to an output file are erroneous.

SPSS, Inc., has no plans to fix errors in Release 9 or to make SPSSX compatible with NOS1; thus, the current situation with SPSS products on the Cyber is likely to remain stable.

GTE TELENET ACCESS VIA THE LOCALNET (SYTEK) NETWORK

Charlie Catlett

GTE Telenet users now have call-out access from the LocalNet (SYTEK) network. There are two 1200 baud call-out ports available at CALL 1500. Minor differences exist between this facility and a GTE Telenet dial-up port. The most obvious difference is that the full 12 digits of the CCITT X.121 standard address must be used with the C(onnect) command.

The format of an X.121 address is as follows:

dnic aaa sssss

(Note: There are no spaces in the actual address; they were inserted in the above format example simply for easier reading.) **dnic** is 3110 (the identification code of the Telenet public data network); **aaa** is the area code field of the Telenet address; and sssss is the server address field of the Telenet address. This field is to be right justified, zero padded.

This long format of the address **must** be used from the LocalNet (SYTEK) Telenet access ports. For example, the Telenet address 21725 would be entered as 311021700025 from the LocalNet (SYTEK) access port.

The LocalNet (SYTEK) to Telenet access uses a Micom X.25 Packet Assembler/Disassembler (PAD) at 1200 bps. To access Telenet from LocalNet (SYTEK), CALL 1500. The SYTEK/Telenet banner will appear as follows:

GTE Telenet localport 9
Use 'C 3110aaasssss'

You will receive the Micom PAD prompt, which is **Telenet>**. The system is now ready to receive Telenet user commands. The LocalNet (SYTEK) set of user commands, however, is a subset of those available at a GTE-supported Telenet access PAD. The CONNECT command is C, as with GTE access. However, the GTE DISCONNECT command (D) is **CLR** on the Micom PAD. No GTE caller IDs are supported, nor is escape to Network Command Mode. This service supports interactive sessions and is not meant for file transfer.

Upon logging out of the remote host, the **Telenet>** prompt is displayed. To terminate the session with the Micom PAD, simply type

<control-P> <control-O> DONE

TCP/IP FACILITATES MULTI-VENDOR, MULTI-SYSTEM NETWORKING

by Dan Ladermann, The Wollongong Group Inc.

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In the midst of the growing push toward worldwide networking standards, Transmission Control Protocol/Internet Protocol (TCP/IP) stands as one of the most significant protocols now available.

One reason for this is that TCP/IP has been specified by the U. S. Department of Defense (DOD) as its standard network protocol. The U. S. Defense Data Network

(ARPANET/MILNET) alone supports over 2000 major nodes and countless subnetworks behind them, all implementing TCP/IP. In addition, contractors who want to supply hardware or software to the DOD, or any military installation, must provide TCP/IP capabilities.

But TCP/IP's consistent functionality and demonstrated facility for working with the widest range of hardware and operating systems are even more significant. TCP/IP is the only protocol that can be used to link a wide range of processors and systems together to provide consistent local and wide area networks. These networks include PCs, workstations, microcomputers, superminicomputers, mainframes, and supercomputers — all with different capabilities, operating systems, and environments. The only element they share is TCP/IP, which provides them all with the ability to communicate.

This flexibility provides major advantages for organizations with large investments in diverse processors and peripherals. For example, workstations can move files over TCP/IP networks to the far greater storage facilities of mainframes. They can also run applications or perform data manipulations in a remote host. In addition, DP managers can feel relatively free to select the best application and hardware for a particular job without being constrained by the need to retain connectivity with installations already in place.

From an end user's point of view, TCP/IP provides a consistent user interface between virtually all types of processors and peripherals. For example, a simple TELNET command connects a local terminal or PC with any host on the TCP/IP network. Equally simple commands control electronic mail delivery and file transfer capabilities among all network users.

If a user anywhere on the network knows the appropriate host name, file name, and user name, he can exchange messages and files with another user without knowing anything about the network or how it operates. He can also walk from a terminal on one host to a different type of terminal on a different host — or to a PC connected to the same network — and issue exactly the same network commands to accomplish exactly the same results.

This consistency and simplicity is a major bonus in organizational settings because it cuts down on training time, errors, and difficulties in using the network.

From a systems point of view, TCP/IP makes sense because it supports what no other network protocol supports: the ability to internet heterogeneous computers, regardless of their operating systems. The Open Systems Interconnect (OSI) model jointly sanctioned by ISO and CCITT will eventually do the same, but it isn't nearly as complete for the variety of processors as TCP/IP.

Also, TCP/IP is non-proprietary, the beneficiary of a decade of active use, and supported by over 60 vendors. For example, with TCP/IP, it's possible to connect IBM mainframes with UNIX-based CAD workstations, to connect VAXs to IBM PCs, or to create a wide area network of office automation workstations, mainframes, and graphics terminals, all from different vendors.

Comparable networks are certainly possible without TCP/IP, but only within a single-vendor environment where there are usually strict limitations on available hardware. Multi-vendor systems are extremely difficult without TCP/IP because DECnet and Ethernet networks aren't easily connected to SNA networks. On the other hand, while TCP/IP may not be as powerful or functional as DECnet or SNA (where proprietary networking is intertwined into the operating systems), it's more practical and functional in a multi-vendor environment.

In addition to multi-vendor flexibility, TCP/IP supports virtually any network topology. For

example, large organizations often install separate local area networks (LANs) in many different facilities. If it later becomes desirable to exchange information among several of these LANs, a wide area TCP/IP interface can be added between one of the processors on each separate LAN, even if they're in different cities or continents. Once connected, TCP/IP enables all three LANs to operate in a single internet that allows any file and data exchange, as well as virtual terminal operations with any processor on any of the networks.

Processors, LANs, wide area networks, and a variety of Ethernet and other communications lines can be added or removed from a TCP/IP internet at any time with no perceptible loss in efficiency and no changes in operation from any user's perspective.

Since TCP/IP isn't a proprietary standard, its vendors all share a common interest in creating TCP/IP linkages to new and more diverse computer systems. This is the direct opposite of the incentives inherent in single-vendor proprietary protocols, where the vendor may limit migration of information and access away from the existing installed base to other vendors' products.

SNA, for example, has been in use for a decade and is only now beginning to implement gateways to other hardware. DEC seems to be making progress in connecting DECnet only to DEC systems. XNS standards have been thrown open, but relatively few vendors are supporting it.

Although there are a very large number of TCP/IP products on the market, they aren't all identical. TCP/IP is different from most other network standards because it has specifications and standards for all levels of the system interface. Its configuration parameters define both the data transmission structure and methods for reliable data transmission, as well as standard interfacing to user-level protocols. But none of the definitions detail how they should be accomplished. So, while all the TCP/IP products can exchange information with each other, vendors are free to implement TCP/IP standards whatever way they deem best.

Some products are implemented in hardware, some in software, and some in a combination of the two. Some use entry points deep within the operating systems of the respective hosts, but not all do. For example, the WINS products from the Wollongong Group are implemented completely in software using each operating system's published entry points.

Network products relying on unpublished hooks into an operating system may be locked out at the vendor's next update. But vendors are strongly committed to maintaining their published entry points. Thus, DP departments don't have to worry about their networking capability disappearing every time a processor in the network receives an update to its system software. Relatively simple and quick TCP/IP updates will keep their networks operating despite any changes in system software.

One way a family of TCP/IP products can work across such a wide range of processors is if they're implemented in three major parts such as portable user-level applications, a network nucleus that is the same for all systems, plus a series of drivers and interfaces to connect that nucleus to a particular operating system.

Thus, as much as 80-95% of the code may be identical from one product family member to another. The major differences between products are the drivers and entry points that allow the applications to call the network functions when needed.

In addition, these products could use a programming scheme to minimize context switching and keep the network functions at the lowest level of the operating system. Networking software that operates at the user level requires considerable overhead processing, seriously compromising the overall throughput of the system.

However, different methods of interfacing with resident operating systems designed to take advantage of each system's built-in functions result in significant reductions in network overhead processing. For example, using TCP/IP's TELNET command to connect a terminal to a host never requires any more processing time than a hardwired terminal would demand, and often uses considerably less.

Different strategies are employed with different operating systems to avoid user-level implementations of the network kernel and to make use of each system's most effective processes for transferring control. In some cases, as with VMS and MicroVMS, entry to network functions is accomplished by dynamically adding two device drivers to the operating system, allowing it to treat the entire network kernel as it would any other device driver.

This approach will not work as well for all operating systems, however. With UNIX, the same effect can be accomplished by linking the device drivers to the unmodified standard kernel, thereby creating a new system that can be rebooted running TCP/IP in addition to the standard system. In every case, the network kernel controls its own devices and eliminates additional processing by the resident operating system.

When the network kernel is nearly identical in every implementation, as in WINS, it's fairly simple to put it on a new processor or operating system and to support new enhancements or updates. The major modifications required are to substitute one set of device drivers for another; and to adjust proprietary software to connect the network nucleus to the operating system.

In addition to greater throughput, product development time is significantly faster with a proven network kernel to form the basis of any new product, since programming resources can then be concentrated on identifying and implementing the most efficient connections between the existing network kernel and the target operating system.

This kernel approach simplifies user support because the products are similar in many ways and the basic procedures for one processor hold true for all others. Trouble-shooting is also simplified, because the TCP/IP network functions can be severed quickly from the native operating system in any processor. In a UNIX system, it's possible to reboot the system using the old, prenetwork kernel.

In other systems, the drivers can be disconnected. If the problem recurs with the network connections severed, the network functions are immediately exonerated. Then if the problem disappears, the network functions are immediately suspect.

Because it's efficient, effective, portable, and a published standard for a large community of influential users, TCP/IP is gaining recognition as a viable, cost effective method for building multi-vendor networks in a variety of diverse environments.

NEW AND REVISED DOCUMENTATION

Following is a list of new and revised CSO Reference Guides, Technical Notes, and manuals.

(Note: The Reference Guide List, RF-0.1, may show some revision dates for reference guides that are not yet in the drawers. We try to announce revisions and new guides only when we are sure they will actually be available at the time of the printing of *OFF-LINE*; however, there are occasionally times when a delay at the printers causes some problems. If we announce a

revision, and you do not find updated copies at the sites, it is probably due to a delay in printing -- mention it to the site operator if you wish, and then check again in a few days. We are sorry if this occasionally causes our users some inconvenience.)

Reference Guides

RF-0.1	Reference Guide List	Revised 11/03/86
RF-0.3	CSO Sites	Revised 9/12/86
RF-0.8	Sending Files to IBM CMS from the Cyber	Revised 11/03/86
RF-0.14	Accessing CSO Computer Systems	Revised 11/03/86
RF-20.10	LABELS	New 11/03/86

Technical Notes

TN-250	Kermit for File Transfer	New 10/06/86

Manuals

Introduction to CMS at UIUC (New -- $2.50 at Illini Bookstore and CSO)	October 1986
Introduction to Computing Services Office (Revised -- Free)	October 1986
Kermit User Guide (New -- $4.00 at CSO only)	October 1986

FOR SALE

The Survey Research Lab has six used 14-inch Memorex and 3M disk packs for sale. If you are interested or have any questions, please call Jon at 333-1257.

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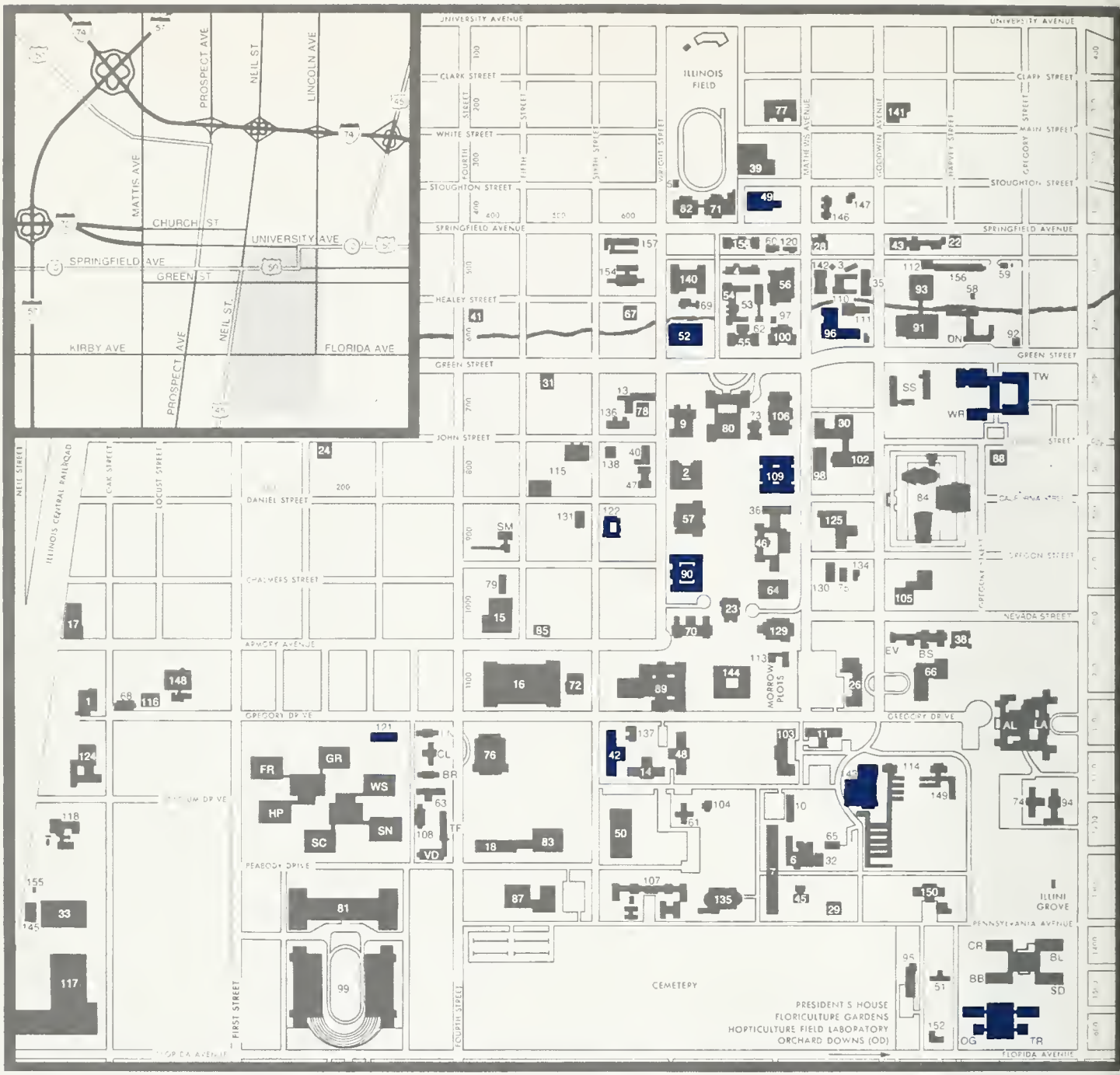

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